

TOMATO PLANTS: TO PRUNE OR NOT TO PRUNE? P. 73



**BEST—
HOMESTEAD
TOOLS
—PAGE 46—**

MOTHER EARTH NEWS

THE ORIGINAL GUIDE TO LIVING WISELY
JUNE/JULY 2015

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TOP TIPS AND TRICKS

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EarthWords

Charles Baudelaire

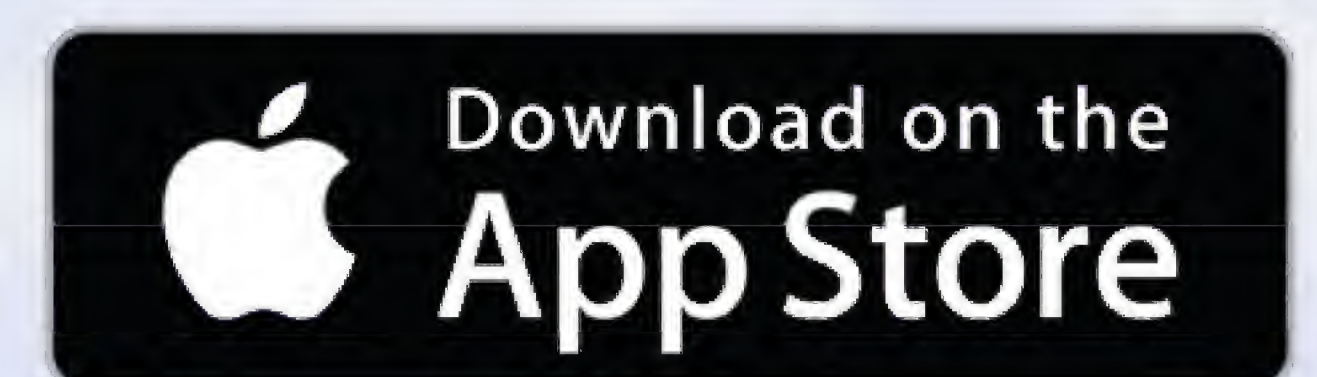
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Monsanto Has Exposed Us to a 'Probable Carcinogen' for 40 Years

Monsanto's blockbuster herbicide glyphosate, brand name Roundup, has been classified as "probably carcinogenic to humans." Earlier this year, 17 cancer experts from 11 countries reviewed the evidence and unanimously came to this conclusion. The International Agency for Research on Cancer (IARC) called for the review.

Roundup is used on millions of acres around the world. In the United States, most farmers now grow genetically modified (GM) corn, soybeans, canola and sugar beets, which are sprayed with glyphosate to kill weeds. The health and environmental risks of this herbicide addiction are increasingly obvious:

- Research in 18 European countries found that 44 percent of tested city-dwellers had glyphosate residue in their urine.
- Testing of 35 urine samples from U.S. women found glyphosate levels 10 times higher than those in the European report. The testing, done by Moms Across America and Sustainable Pulse, also found glyphosate in three of 10 samples of breast milk from U.S. women.
- Samples tested by the U.S. Geological Survey show that glyphosate contaminates air and water in agricultural areas.
- Glyphosate is also used as a desiccant to dry wheat before harvest. Government testing in Britain showed that more than 60 percent of nearly 3,000 bread samples contained pesticide residues, with glyphosate being one of the most frequently detected chemicals. Meanwhile, the U.S. Department of Agriculture does not monitor our food for glyphosate residues, reportedly because testing is "extremely expensive."

Glyphosate
is sprayed
on millions
of acres.

Monsanto began selling glyphosate to farmers in the 1970s, so we've been exposed to this chemical for more than 40 years. Monsanto continues to deny that any reason exists to restrict its use.

The IARC experts also judged another widely used pesticide, malathion, to be "probably carcinogenic to humans." Malathion is an organophosphate pesticide, and, according to a 2010 report in *The Journal of the American Medical Association*, children exposed to such pes-

ticides "are at greater risk of developing attention-deficit (hyperactivity) disorder (ADHD)." Malathion was sprayed over residential areas in California in the 1980s to combat Medfly outbreaks and many cities have used it to control West Nile virus carried by

mosquitoes. It's also applied to wheat, rice, sorghum and dozens of other food crops.

The regulations that should protect us from harmful chemicals are clearly not working when, again and again, decades must pass before enough evidence accumulates to prove these chemicals are dangerous. Isn't it time for the public to demand that farmers step off this pesticide treadmill? Organic farmers don't use these poisons, and organic farming is expanding. Yes, many organic products cost more today—but sometimes only a small amount more. One of the best ways to help push our agricultural system toward less toxic and more sustainable methods, and to protect our health, is to buy organic whenever we can, and press for the labeling of GM foods. The more the public demands organic choices, the more the system will shift so that organic becomes more affordable.

—MOTHER

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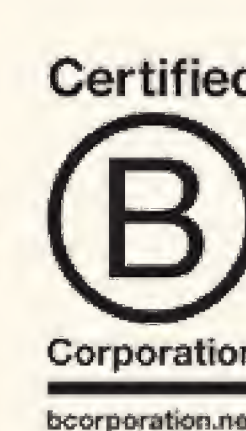
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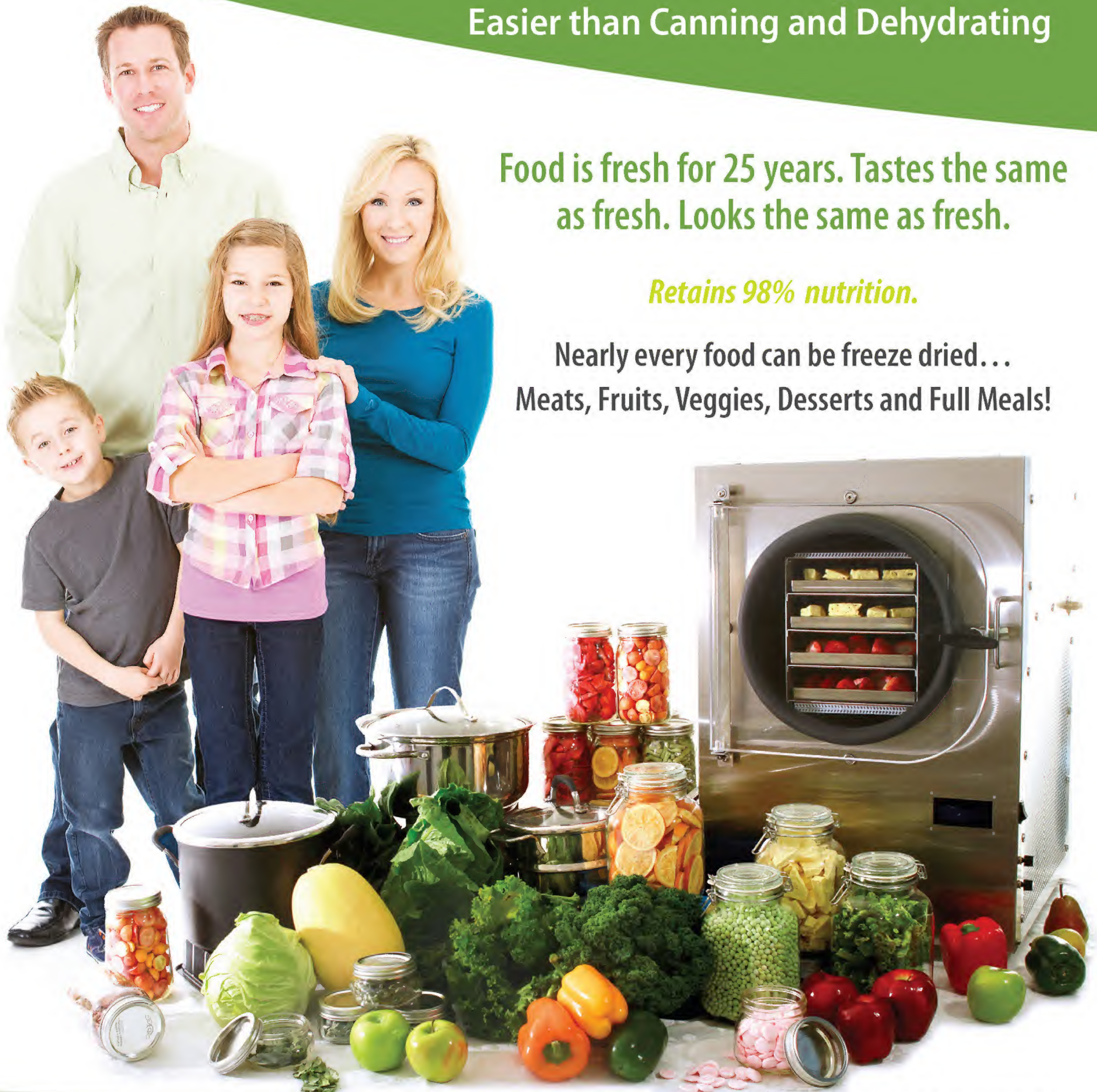
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“Maybe we should think twice before we buy those cheap steaks on sale.”



Though grass-fed meat tends to fetch a higher price, if we factor in the environmental and health costs of industrial meat, such “cheap” products in fact prove quite expensive.



EDITORS' PICK

Solar at Last

I want to thank MOTHER EARTH NEWS and EnergySage for all the help making my solar energy dream become a reality. I've been thinking about solar power for my home for about 40 years. The economics have been improving, but I wasn't sure just how financially feasible it would be until I came across the write-up about EnergySage in the February/March 2015 issue (Green Gazette, “Compare Solar Prices on EnergySage”).

The article inspired me to go online to www.EnergySage.com and enter all of my information. The process EnergySage has set up is wonderful—and, wow, was I surprised by what I learned! I got three great quotes from highly reputable companies, and then EnergySage's help explaining the ins and outs of the different equipment gave me the final push. I've since signed a contract with one of the companies, and they will install my system next month. I'm so excited, and, again, I can't thank EnergySage enough for the assistance and expertise.

*Tim Cherry
Nacogdoches, Texas*

Ruminating on Low-Cost Meat

I couldn't agree more with Richard Manning's points in “The Multiple Benefits of Grass-Fed Meat” in the April/May 2015 issue.

Most of the meat in U.S. supermarkets is raised in feedlots. This is in contrast to how we picture cattle happily grazing on lush, green pastures. The reality is cows crowded into filthy lots, eating some ungodly mixture that contains primarily corn,

with numerous additives and antibiotics. The beef industry has worked hard to convince us that meat from corn-fed cattle is better.

Where did this idea come from? I read that the advent of synthetic fertilizers and other agricultural chemicals about 50 years ago led to an overproduction of corn. A sensible response to such surplus would've been a shift to growing a crop that was needed on the market, but the industry instead

decided to find some other market for the overabundance of corn. Then, some folks had a bright idea: If we feed cattle corn instead of grass, we can fatten them for slaughter in nine months instead of two years. This put more money in many people's pockets.

But we forgot that cows are ruminants and need to chew their cud to maintain their health. So what if we mess up the animals' digestion? They only need to

Bury Your Treasure

I built my root cellar from a never-used concrete septic tank following the plans in your April/May 2014 issue (“Root Cellar Plans: Take It Underground”). The construction was much simpler than it would've been had I made the root cellar from cinder blocks or concrete poured in place, and this storage space has performed even better than I had expected.

My brother and I are attempting to produce all of our own food for 2015, and we would've already failed if we didn't have this dark, moist, cool place to keep vegetables in peak condition.

*Garth Brown
West Winfield, New York*



The Brown brothers turned a 6-by-6-foot unused septic tank into a stellar root cellar.

Garth and his brother, Edmund, are documenting their quest to eat only homegrown, hunted or foraged food for a year. Read their updates at <http://goo.gl/kf2sSN>. —MOTHER

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Dear MOTHER

survive less than a year. So what if they're not in perfect health? We can give them medicines and tons of antibiotics to keep them alive for the short time before they go to slaughter. Then we'll sell meat from sick cows in the supermarket with a USDA stamp of approval.

A few years ago, an *Escherichia coli* (*E. coli*) bacterial contamination made many people sick, and some even died. In the '70s, I worked in medical research with *E. coli*—a mostly benign bacteria that, if accidentally ingested, might give you a bellyache but would not kill you. The emergence

of the very virulent, deadly *E. coli* strain is the result of the feedlot diet changing the pH in the cow's rumen.

The public demands cheap food, and cheap it is—provided we count only the money spent at the supermarket. If we calculated the real costs of cheap meat—such as the destruction of our environment and the exorbitant health costs—it would prove to be quite expensive.

I understand humans are omnivores who eat meat and kill animals for food. But we don't have to torture them while they're alive. If I treated my dog the way

cattle are treated in feedlots, I would be charged with animal cruelty. Maybe we should think twice before we buy those cheap steaks on sale. For several years now, I've purchased only grass-fed meat, and I've sourced it from local farms that I can visit and inspect to see how the animals are treated.

Dana Fast
Lake Clear, New York

Recycle It—Then Re-Buy It!

In the February/March 2015 issue, you printed a wonderful article titled "Is

(CONTINUED ON PAGE 77)

Big Cities, Same Goals

I grew up in a small town in Ohio's farm country, but I've lived my adult life in either urban or suburban settings. Like many, I have respect for those courageous enough to go "back to the land" and chuck all the cares of modern life. However, I've also developed a healthy respect for urban and suburban culture, comfort and convenience.

In reading MOTHER EARTH NEWS, I find many ideas that apply just as well to wiser living in urban and suburban settings as they do to rural. There are urban homesteaders—people who raise chickens and other livestock in the city, who strive to get off the grid, and who are insisting that urban infrastructure reflect the ideals perpetuated by MOTHER. Still, I would like to see even more editorial content for and about people who can't—or don't want to—escape the city or the burbs, but who want to recycle, live organically, plant gardens in vacant lots, and get some of their electricity from renewable sources. I want to read about people who grow their plants in window boxes or on narrow strips of ground, who collect their grass clippings for mulch (there's plenty of grass!), and more.

Cleveland, near where I live, was hit hard by the financial crisis, and led the United States in foreclosed and demolished properties. Now, it's leading the way with a land bank, environmental supervision, wetlands reclamation, roof gardens, solar farms, wind turbine development, and one of the finest systems of urban green space in the country.

Thomas Ford
University Heights, Ohio



Growers work in a raised-bed garden built on a gravel parking lot in Cleveland, a city that has become a stronghold for urban farming.

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Circle #1; see card pg 81



Should We Be Spending More for Better Food?

U.S. consumers allocate a lower percentage of their annual expenditures to groceries than people in any of the other countries for which this data is tracked, according to the U.S. Department of Agriculture.

The average person in the United States spends just 6.7 percent of his or her budget on food consumed at home (not including eating out). This percentage has steadily decreased over time: In 1980, it was about 10 percent for food eaten at home, and in 1960, it was about 15 percent.

Why do people in the United States shell out so little for their groceries today? As with most things, the answer is complex. Affordable food may appear to be a positive development, but it has a dark side. Thanks to taxpayer subsidies put in place by Big Ag lobbyists, as well as the chemical tricks of the food industry, our food system is flooded with cheap, poor-quality junk, and it's pushed at us with billions of dollars in advertising. The main objective of many industrial food producers—in other words,

the way to maximize their profits—is to produce lots of empty calories as inexpensively as possible.

Our wealth plays a part, too. In general, the more affluent a nation is, the more its people can spend their money on other needs and luxuries—from health care to entertainment—which ultimately drives down the percentage spent on food. Part of valuing something means investing in it, though, and many people in the United States tend to forgo a significant investment in high-quality fare. Keep in mind that fresh produce is more costly than pre-made, packaged goods. Culturally—and paradoxically—we seem to *value* cheap food, and the main goal of grocery shopping for many of us is to pinch pennies and buy bargain food, even when we could make space in our budgets to fork over more.

Compare us with Norway, for example: Average Norwegians spend about twice the percentage we do on food eaten at home, even though Norway's wealth per capita is similar to ours. True, grocery costs are slightly higher in Norway, but that alone isn't enough to account for us spending so much less overall. The

current average cost of a cartful of select food staples—including milk, bread, rice, chicken, eggs and produce—in Norway is 50 U.S. dollars. If U.S. shoppers came home with the same stock of unprocessed staples, we would have spent only slightly less, at \$42. Because shoppers here tend to buy more processed food, however, in reality we're spending only about \$26 to every \$50 a Norwegian spends. We seem to be skimping on the staples and putting more cheap items in our carts, whether by choice or necessity, depending on income level and food access.

What would our food system look like if we spent more on our groceries and cooked more fresh-ingredient meals at home? Prioritizing spending the money for better-quality food, whenever possible, may well help curb the growing problems of foodborne illnesses, obesity, and environmentally damaging industrial farming practices. The more income families are able to budget for humanely raised chicken, drug-free beef, and fresh foods produced without synthetic fertilizers and pesticides, the more they'll be investing in their health. This paradigm shift will also benefit local, smaller-scale farmers and create a more secure and resilient food system for us all.

—Shelley Stonebrook

Food Spending Around the Globe



SOURCE: U.S. DEPARTMENT OF AGRICULTURE ECONOMIC RESEARCH SERVICE

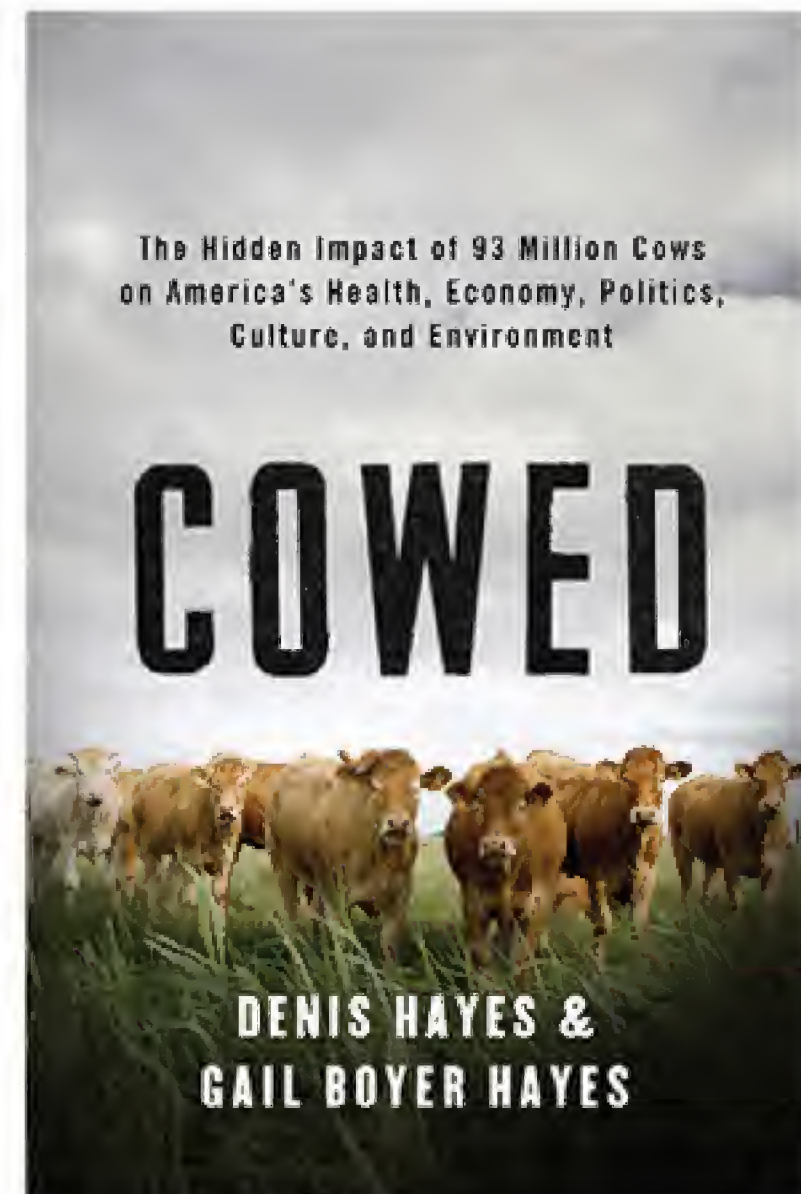
Amazing Grazing: 6 Recommended Books

How bad is the production of factory-farmed meat for animals and the environment? How much more nutritious is grass-fed meat than industrial meat? How can rotational livestock grazing sequester carbon to help slow climate change?

Meat production, human nutrition, soil health and climate change are interconnected topics that weave a complex picture. Current research tells us that managed intensive grazing, which mimics the mob-grazing movement of wild herds of animals, can produce dramatic improvements in soil health and water management. It also means more humane treatment of livestock. Plus, studies show that eating meat from wild or grass-fed animals may be the best way for us to

get the essential fatty acids that are vital to optimal brain function.

Much of the recent media coverage on the environmental costs of meat production has been oversimplified and focused only on confined animals, treated with drugs and raised in feedlots. A steady flow of new research, though, is showing that the environmental and health impacts of meat from pastured animals are far better than that from the feedlot system. For a primer on this important topic, don't miss our article "The Many Benefits of Grass-Fed Meat" online at <http://goo.gl/aw59Dz>. For more in-depth coverage, start with any of these six excellent books (many of which are available on Page 64).



- *Cowed: The Hidden Impact of 93 Million Cows on America's Health, Economy, Politics, Culture and Environment* by Denis Hayes and Gail Boyer Hayes
- *Cows Save the Planet, And Other Improbable Ways of Restoring Soil to Heal the Earth* by Judith D. Schwartz
- *Defending Beef: The Case for Sustainable Meat Production* by Nicolette Hahn Niman
- *Go Wild: Free Your Body and Mind from the Afflictions of Civilization* by John J. Ratey, M.D., and Richard Manning
- *Grass, Soil, Hope: A Journey through Carbon Country* by Courtney White
- *The Soil Will Save Us: How Scientists, Farmers and Foodies Are Healing the Soil to Save the Planet* by Kristin Ohlson

—Cheryl Long

New Report Predicts Severe Drought

Unprecedented droughts lasting several decades are expected to plague the Southwest and Central Plains during the last half of this century, according to a new report by authors from Columbia University, Cornell University and the NASA Goddard Institute. These future "megadroughts," as scientists are calling them, would be more severe than any dry period experienced in North America within the past 1,000 years.

The study's authors, who published their findings in the journal *Science Advances* in February, paired historical data of past drought trends with the most advanced climate models to make their predictions.

"In both the Southwest and Central Plains, we're talking about risk levels of 80 percent that a 35-year-long drought will occur by the end of the century if climate change goes unmitigated," says study co-author Toby Ault, a professor of earth and atmospheric sciences at Cornell.

While droughts are a natural part of the planet's climate cycles, research has shown that higher temperatures resulting from human-produced greenhouse gas emissions will exacerbate natural dry

spells by increasing evaporation rates during the same time period that precipitation will drop. Many scientists characterize regional climate change impacts with the generalization, "Wet places will get wetter and dry places will get drier." Recent studies affirm this prediction—not only for the parched Plains and Southwest, but also for the relatively wet eastern half of the country, where precipitation is projected to increase.

Groundwater used for irrigation is already being depleted at an unsustainable rate in many agricultural regions. A decades-long drought in these areas would spell devastation for the farmers who produce the amber grains of the Central Plains, and for the industries and exporters that rely on U.S. wheat, corn and soybeans. We don't have

to follow this path, however. If we cut our carbon emissions, the study's authors say, we can mitigate climate change and significantly reduce drought risk, especially for the Central Plains. To read the full report, go to <http://goo.gl/63eK9s>.

—Kale Roberts



Farmers in the nation's breadbasket may face decades-long droughts.

Try a New, Improved Swamp Cooler

Cooling units known as “swamp coolers” chill the air using much less energy than conventional air conditioning. Swamp coolers have been around for decades, but older designs—also known as “direct evaporative coolers”—add a lot of moisture to indoor air, so they’ve been viable only for dry, low-humidity climates, such as the Southwest.

Now, newer designs called “indirect evaporative coolers” are on the market. They take advantage of evaporative cooling effects, but chill the air without raising indoor humidity, meaning homes in more regions can tap this technology to stay cool and comfortable for less money and energy.

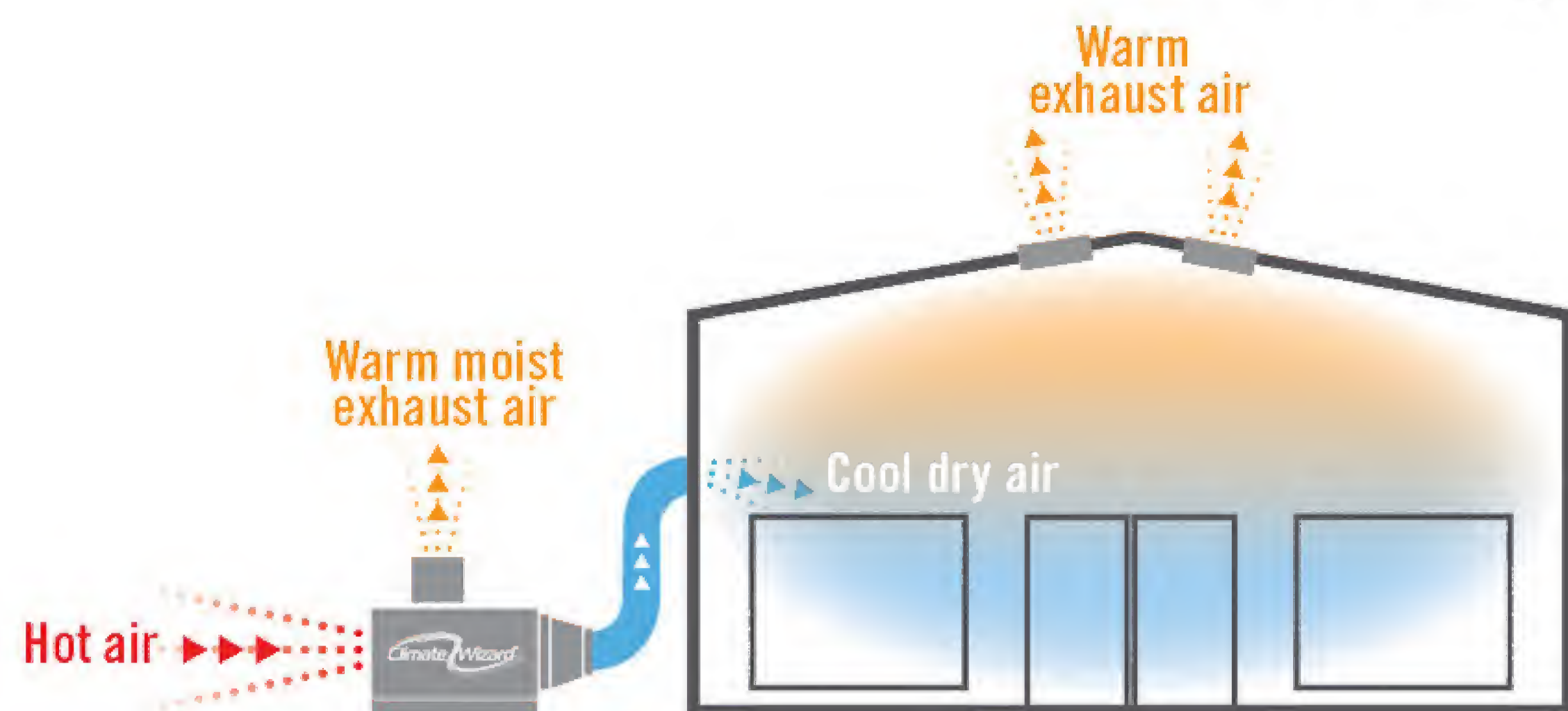
An indirect evaporative cooler runs on up to 80 percent less energy than a conventional air conditioning unit. That’s because, like your refrigerator, standard AC uses electricity to power a compressor that pressurizes a refrigerant.

Evaporative cooling, on the other hand, relies instead on the inherent quality of water to absorb heat when it evaporates (changes from a liquid to a gas). In indirect evaporative cooling, two opposing airstreams contact different sides of a heat exchanger. The evaporation of water cools one side of the heat exchanger, while the other side provides a cool, dry airstream without picking up humidity the way an older swamp cooler would.

Note that evaporative coolers are challenged by salty or mineral-rich water. The ideal source for a unit is rainwater, such as filtered rainwater from a cistern.

Unit size, performance and availability vary, but key manufacturers of indirect evaporative coolers include Climate Wizard (based in Australia but has a U.S. office and dealers; www.ClimateWizard.com) and Coolerado (only for commercial installations at this time; www.Coolerado.com). Your local building supplier or HVAC specialist may already partner with an indirect evaporative cooler supplier, but if not, ask them to work with you on sourcing a unit. Installation is easy, and the units are quiet and durable.

—David A. Bainbridge



Indirect evaporative coolers chill the air without imparting humidity, and they run on up to 80 percent less energy than air conditioners.



This handy tool “mows” delicate greens, drastically cutting harvest time.

Gettin’ Those Greens

Market gardeners, take note: A remarkable new tool called the Quick-Cut Greens Harvester will take a huge whack out of your harvesting time. The Harvester, designed by and available from a company called Farmer’s Friend (www.FarmersFriendLLC.com) in Williamsport, Tenn., uses a spinning, flexible brush to push greens across a cutting blade and then capture them in a large basket. Powered by a rechargeable drill, the \$559 unit can cut all kinds of greens many times faster than someone cutting by hand. You really need to see the video at <http://goo.gl/RJHnb8> to appreciate this new tool. Together with hoop houses, this harvester could allow every community in the country to more easily enjoy a wide selection of super-fresh, locally grown, lighter-footprint organic salad greens year-round!

—Cheryl Long

Fuel Flick

Imagine your local filling station, transformed: Instead of a few pumps supplying only gasoline, there are hoses for methanol, ethanol, gasoline and CNG (compressed natural gas)—and even a fast-charge station for electric vehicles. This is the vision fueled by *Pump*, a documentary film that highlights U.S. consumers’ lack of choices at the filling station. *Pump* takes viewers on a road trip through history, from monopolists’ schemes to derail public trans-

portation and limit fuel options, to present-day kits and software updates for converting standard automobiles into flex-fuel cars. *Pump* delivers the goods through interviews with industry analysts, entrepreneurs and engineers working to overcome our oil addiction. The movie drives home that, beyond feeding consumers’ demands for more options, offering a range of alternative fuels at the pump can help steer us toward energy independence. *Pump* is available to watch on several platforms; discover more at www.PumpTheMovie.com.

—Rebecca Martin

Se Hablan ‘Sustainability’

To meet the needs of the country’s increasing population of Hispanic farm owners, the USDA’s Sustainable Agriculture Research and Education Program (SARE) has created Spanish translations of some of its most popular resources. *¿Qué Es la Agricultura Sustentable?* (“What Is Sustainable Agriculture?”) provides examples of producers, educators and researchers who’ve successfully implemented sustainable practices. Other translated reports cover marketing, rotational grazing, resources for producing profitable crops and livestock, and more. Print copies of these titles are free to farmers in the United States, and are also accessible online at www.SARE.org/Espanol.

—K.C. Compton



The Gardener's Table

BEAUTIFUL BULBS

*Growing and Cooking
Fennel and Scallions*



Invite fennel's refreshing anise flavor and scallions' allium zing to your summer table.

Story and photos
by Barbara Damrosch

Two bulbs, two different flavors: Fennel and scallions come into their own in early summer. Perhaps it's time you welcomed both, along with their distinctive flavors, into your own garden and kitchen.

Fennel, once considered a gourmet vegetable and used only in certain

Mediterranean dishes, has earned a place in contemporary cookery. You can now find fennel bulbs in markets and spot them in home gardens. Fennel's distinctive flavor is a bit like that of anise, licorice and tarragon, and it comes from compounds they all share.

Botanically, fennel is kin to celery, dill, carrots, and other members of the *Apiaceae* (or *Umbelliferae*) family—plants that bear umbrella-shaped flower clus-

ters. In fact, one form of fennel, grown as an herb for its leaves, flowers and seeds, is much like dill, with fern-like fronds. Sometimes called “wild fennel,” it's tall and grows like a weed in areas—notably California—that have Mediterranean climates. Its flowers are a terrific nectar source for beneficial insects.

The other kind of fennel—which also has ferny tops, only shorter—is known as Florence fennel, bulb fennel, cultivated fennel or sweet fennel. It has a white, swollen area near the ground, made up of widened stem bases wrapped tightly around each other in overlapping layers.



Grow and Harvest Fennel

Fennel is often characterized as a fall vegetable, but a hard frost will take it down much earlier than hardier fall crops, such as carrots and kale. At our Maine farm, we're not content with such a short season, so we treat ourselves to

an early summer one as well. You can do the same by setting out transplants as soon as there is no longer danger of frost. Start seeds indoors two to four weeks before your average last frost date.

If planted in spring, sometimes an unexpected cold snap will make fennel

bolt (go to seed) before it's had a chance to form bulbs. This happens because biennial fennel interprets the cold snap as its first winter and the subsequent onset of summer weather as its second spring. The best way to avoid this is to plant a bolt-resistant variety, such as 'Zefa Fino' or 'Montovano.' (*Find sources for both varieties at www.MotherEarthNews.com/Custom-Seed-Search. —MOTHER*) Fertile soil and regular watering will also encourage a good crop.

Harvest anytime after the fennel bulbs start to form, and enjoy them from 2-inch-wide babies to 5-inch-wide giants. The bulbs will turn woody if left in the ground too long. Fennel bulbs will require some trimming in the kitchen, and the outer layer should be removed if it is tough or has brown spots. You may chop off and discard the hollow stems, though I often save a few in the fridge to flavor stocks. The ferns are useful to snip as herbs or as garnish for platters.

Fennel Antipasto

Walk into some wonderful old Italian restaurant and you might be greeted by a table of *antipasti*—the plural of *antipasto*, which means “before the meal”—complete with sliced meats, cheeses, fish perhaps, and, my favorite, vegetables in olive oil. It's hard not to make a meal of them alone. Florence fennel, either raw or cooked, makes a great antipasto. In this recipe, it's thinly sliced and sautéed to caramelize its natural sugars. This gentle browning emphasizes the beautiful layered structure of the bulb. *Yield: 4 to 6 servings.*

4 fennel bulbs, 3 to 4 inches across

¼ cup olive oil

2 cloves garlic

1 tsp fennel seeds (optional)

Coarse sea salt

Freshly ground black pepper

1 small bunch of fennel fronds (for garnish)

Scrub and trim the fennel bulbs, leaving enough of the bases to keep the slices intact. Stand the bulbs up and slice them lengthwise to make fan-shaped pieces no more than 1/4-inch thick.

Heat the olive oil and garlic in a medium-sized skillet until fragrant. Add the fennel slices carefully in a single layer, with none touching. Over low to medium heat, sauté them for about 5 minutes or until they're golden-brown, moving them around in the pan so they color evenly. This will require your full attention. Flip them and brown the other side. Remove carefully with a spatula and drain on paper towels, leaving the garlic behind. Pound the fennel seeds, if using, with a mallet on a cutting board, then toast over low heat in a small, dry skillet, just long enough to release their flavor.

Arrange the fennel slices on a warm plate and scatter the seeds, salt and pepper over them. Garnish with the tips of the fennel fronds. Serve warm or at room temperature.



Fennel Finesse

Fennel's uses are endless. Slice it and add it to scalloped potatoes or make a gratin with it. Include it in stocks, soups and stews — especially fish stews, such as bouillabaisse. Cooking fennel mellows it, so if you want to restore some of its anise intensity, try adding fennel seeds or anise-flavored liqueurs and spirits, such as Pernod, ouzo, anisette or sambuca.

Bulb fennel can be sliced, chopped or shredded, and then eaten raw in salads or slaws. Individual segments, which are joined by a core at the bottom, can be pulled off and nibbled as crudité, used as scoops for a dip, and even served as a slightly sweet palate cleanser and breath freshener to chew on after a heavy meal. Thomas Jefferson, who grew fennel at Monticello, considered fennel a dessert. Try it topped with goat cheese, drizzled with a little honey.

The bulb's hard little base could be removed before shredding, but is often useful for holding the layers together, as when it's sliced thickly top to bottom and then grilled. A brief poaching before grilling will tenderize



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it. Braising makes the bulb meltingly tender, revealing an almost artichoke-like flavor.

Store fennel in a fridge or root cellar for several weeks, but any longer and it will start to brown. For longer storage, blanch and freeze some for winter use.

Stuff a chicken with the fronds, or moisten them and lay them under fish, meats or vegetables on the grill. You can even strew fennel fronds over the coals to flavor the smoke.

Success with Scallions

Scallions are also a crop with more than one season, so learning how to grow scallions is especially useful. You might plant some for harvesting in early summer and fall, and even winter and spring in mild climates. I



Planting scallion seeds in clusters makes them easy to harvest as a convenient bunch later.

like 'Evergreen Hardy White' for its winter hardiness, and 'Nabechan,' a good-tasting Japanese variety that has worked well for us. At our farm in Maine, we can have them by June 1 in a minimally heated greenhouse.

We sow them as multi-plants—that is, a cluster of seeds dropped into a soil block or plug—and then set the plugs 8 inches apart on all sides as transplants. This makes weed prevention easier, because we can scuffle a



Fennel Salad with Oranges

Raw fennel and oranges are a traditional pairing. I like Cara Cara oranges, a low-acid, sweet-tasting navel type with a vivid hot-pink interior. *Yield: 4 servings.*

3 fennel bulbs, 3 to 3½ inches across	Freshly ground black pepper
6 small scallions	½ cup olive oil
¾ cup grated Parmigiano-Reggiano cheese	3 tbsp sherry vinegar
Coarse sea salt	1 tbsp orange juice
	2 Cara Cara oranges
	4 small handfuls of arugula

Scrub and trim the fennel bulbs, quarter them lengthwise, and cut out the cores. Holding the segments together at the top, shred them using a mandoline or grater. You can also use a food processor with a shredding attachment. Trim the scallions, removing the roots and any wilted foliage. Cut both white and green parts into 1/4-inch segments, and then reserve 1/3 cup of the green tops. Combine the fennel, cheese, remaining scallions, salt and pepper in a small bowl.

Whisk together the olive oil, vinegar and orange juice in a second bowl. Add half the dressing to the fennel mixture and stir. Peel the oranges, picking off as much white pith as you can without tearing the fruit. Slice thinly, horizontally.

To assemble the salad, place a handful of arugula on each of 4 salad plates. Mound the dressed fennel in the center of each. Arrange 3 orange slices on the side of each plate, making a cut in each circle from the outside to the center so you have a necklace instead of a ring. Overlap one end over the other to give the slice a little height. Drizzle the remaining dressing over the arugula and the oranges, and sprinkle the reserved scallion tops over all. Serve immediately.

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Circle #35; see card pg 81

hoe between the well-spaced clumps, and then harvest each cluster as a nice, tidy bunch.

I prefer scallions that aren't much more than two months old because the foliage gets coarse as time goes on. But even old plants can be useful in an onion emergency. When I've used up the storage onions, the summer ones have yet to come, and there's no time to go shopping, I find I can have almost a perpetual supply of scallions if I'm willing to stretch my definition of what a scallion is. I can rob an onion bed of young shoots if they're more or less scallion-sized, and use them the way I would scallion tops. Chopped and sprinkled over any savory dish, they do just what scallions do—brighten its color and flavor. This thinning might even improve the spacing in the onion row. Thinnings from a garlic or shallot row can also play a scallion's role.

Need more delicate ones? Use some overgrown chives. Finally, in late winter, when the onions in the storeroom start going soft and sending out long green stems, those stems can impersonate scallions as well.

As for the real scallions, you can use them raw for sprinkling or dipping, but don't neglect them as a cooked vegetable. They don't need long cooking, are surprising and deeply flavored when roasted or grilled, and of course are a natural in stir-fries and sautés. Scallions make the perfect companion to fennel in the recipe for Braised Fennel at right. Scallions can be frozen, too, but with these wider definitions for scallions up my sleeve, I've never felt the need. 🌱

Garden writer Barbara Damrosch grows fennel, scallions and much more with her husband, Eliot Coleman, at Four Season Farm in Harborside, Maine. Find even more seasonal, simple recipes in her latest book, *The Four Season Farm Gardener's Cookbook* (available on Page 64).



Braised Fennel

Cooked slowly in liquid, fennel's anise flavor becomes muted, its texture is tenderized, and it takes on the earthiness of braised artichoke hearts. Cooking the bulbs with scallions adds a bit of pungency, and raisins steeped in sambuca, an anise-flavored liqueur, give back a bit of that licorice flavor, along with some sweetness. *Yield: 4 servings.*

<i>4 fennel bulbs, about 3½ inches across</i>	<i>3 bay leaves</i>
<i>3 tbsp olive oil</i>	<i>¼ cup raisins</i>
<i>1 cup chicken broth</i>	<i>3 tbsp sambuca</i>
<i>½ cup dry vermouth or white wine</i>	<i>12 small scallions, roots trimmed off</i>
<i>2 cloves garlic, pressed or grated</i>	<i>Freshly ground black pepper</i>
<i>Dash of salt</i>	

Preheat the oven to 350 degrees Fahrenheit. Trim the fennel bulbs and cut each in half lengthwise. In a shallow ovenproof casserole on the stove over medium heat, brown the fennel in the olive oil with the bulbous side down, flipping each one after the center has darkened, and paying close attention so they don't burn, about 10 minutes. Flip over and brown the flat sides evenly, about 10 minutes longer. Pour the chicken broth into a small saucepan and taste for saltiness. Add the vermouth and garlic and bring to a boil. Pour over the fennel, adding just a dash of salt if needed. Tuck the bay leaves among the fennel slices. Cover the casserole and put in the oven for 30 minutes.

While the fennel is cooking, combine the raisins with the sambuca and 2 tablespoons of water. Simmer on low heat for a few minutes, removing from heat when about 2 tablespoons of liquid remain in the pan. Set aside to steep. Stir and add a little more water if the raisins clump together.

Cut the scallions at the branching point and set the tops aside. Chop the white parts in lengths about 1½ inches long. Chop the greens in ¼-inch segments.

When the fennel is tender, add the white parts of the scallions, re-cover, cook 10 minutes more, and then remove from oven. (The scallions will give off some liquid, so if the dish is too soupy, pour the juices into a saucepan, reduce until thickened, and then pour back in.) Stir in the raisins, distributing them well. Grind pepper generously over the dish and sprinkle it with 2 tablespoons of the chopped scallion tops, reserving the rest for another purpose. Serve immediately.

TIME TO DIG IN!

Learn more about growing and cooking fennel, scallions and dozens of other popular garden crops online at www.MotherEarthNews.com/Crops-At-A-Glance.



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HOME FOOD PRESERVATION

33 Top Tips and Tricks

Stock your pantry like a pro by following these experts' tried-and-true canning techniques.

By Jennifer Kongs

Nearly a decade ago, I arrived in my grandparents' kitchen with a pound of beets, some apple cider vinegar and a craving to learn how to can. My interest in sustainable food had grown while studying the environmental and health problems of our industrial food system, and had led me to a simple solution: Harvest beets from my organic garden and pickle them in my own kitchen. After a couple of hours with my grandparents, I had safely preserved my ruby gems. The pings of the lids sealing fed my desire to produce healthy food for year-round meals, and to continue the multi-generational tradition of canning and preserving.

Newbies often approach home preserving with trepidation and no grandparents to teach them. As long as you follow a recipe and safe canning methods, you'll be able to preserve all sorts of foods. A few hours of energy use will reward you with months of energy-free food storage, and an unsurpassed feeling of security and wealth.

I turned to our readers, book authors, our editorial team, and, of course, my grandparents, to compile these pro canning tips. For step-by-step processing instructions, refer to any of the books in "Resources" on Page 27. Find more how-to and myriad tested recipes at www.MotherEarthNews.com/Canning.

Planning Makes Perfect

Experienced home canners know to plan, and then can accordingly. If you don't spread jam on biscuits every morning, then don't preserve enough jam to feed the whole neighborhood. The time investment isn't worth it (although homemade jam with a hand-lettered label and a ribbon tie makes a great all-occasion gift).

1 Think about what you'll realistically eat. Take into account the food your family enjoys. Plan for meals based on what's in your



Save energy by heating jars in your water bath canner while it's preheating.

pantry, and **make substitutions to recipes** to include what you've preserved. —*Sharon Astyk*

2 Calculate your annual needs for whatever you're planning to preserve. I felt like a genius when I realized I use approximately four 14-ounce cans of diced tomatoes a month, and that if I just canned 3 or 4 pints a week during tomato season, I'd end up with all I needed for an entire year. —*Robin Mather*

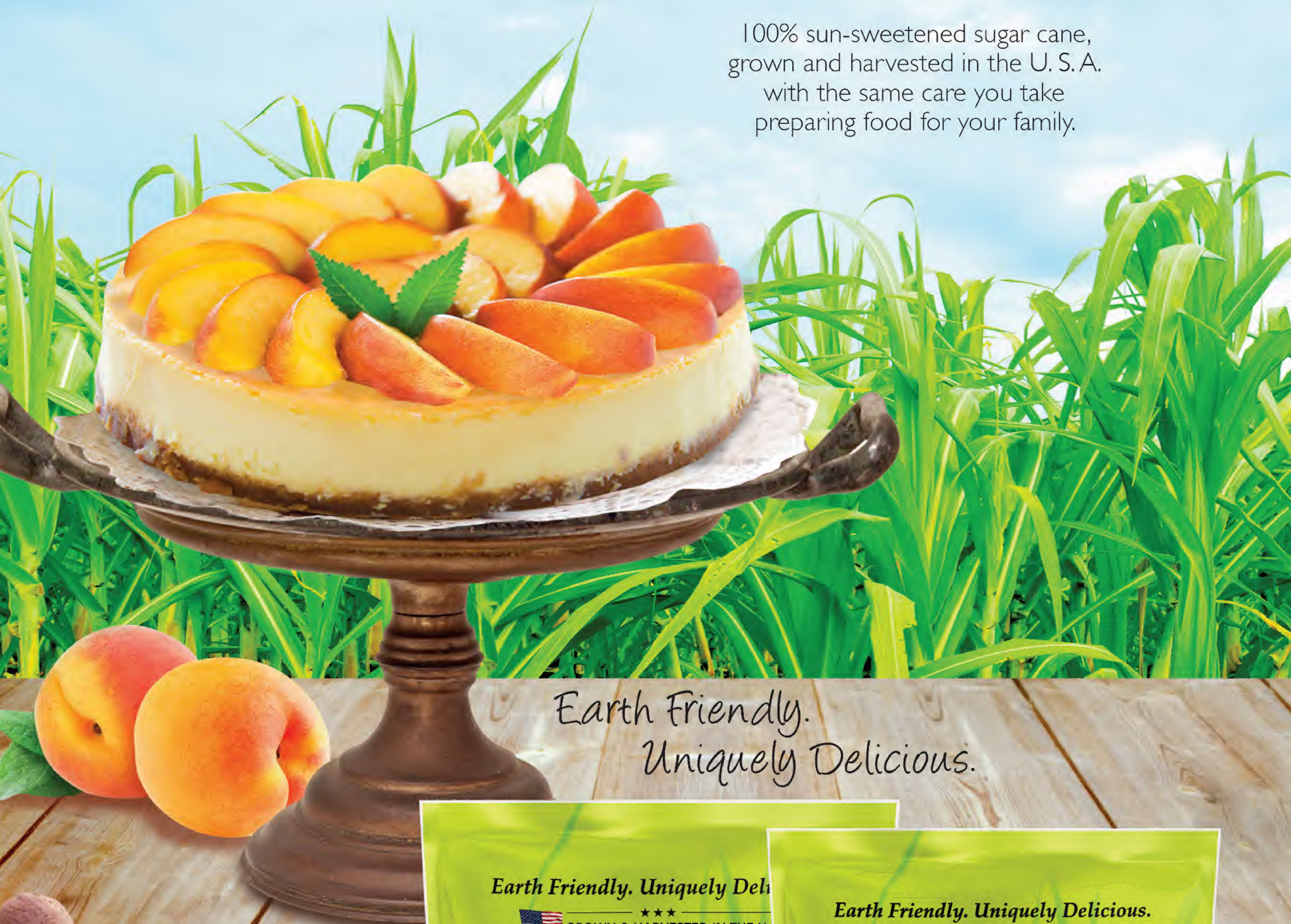
Set Up the Basics

Any reputable canning book will deliver detailed how-to instructions, but you can also learn the ropes by offering to assist an experienced preserver. As a home canner who's taught a few folks in her own kitchen, I welcome both the company and the helping

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Invest in an inexpensive water bath canner kit to load your larder with homemade jams, jellies, pickles and salsas — no pressure canner needed!

hands. Here's how several experts got a handle on basic canning methods and stepped up to intermediate-level skills.

3 To get started, I took a home preserving class from an extension office. —*Nikole Brundick*

4 Read through canning instructions and recipes several times before starting. Follow directions, don't change anything other than herbs and spices, and you will preserve safely. —*Cathy Barrow*

5 Start your recipe searches with the *Ball Blue Book Guide to Preserving* or another trustworthy book. I know too many friends who simply browse Pinterest or the Web for canning and preserving recipes, not realizing that all recipes should be carefully formulated and tested to ensure proper food safety. —*Shelley Stonebrook*

6 Know your spreads: A jam contains pieces of fruit, whereas a jelly uses only the juice. Although any sweet fruit spread may be called preserves, technically, preserves are made with whole fruit. A conserve is a jam or preserve that includes dried fruits and nuts. Marmalades are usually made with citrus and slivers of peels. Fruit butters are purées, such as applesauce, cooked down to a spreadable consistency. Syrups are pourable liquids. —*Leda Meredith*

7 I've created an outdoor canning kitchen. My setup is portable and consists of a camp stove or two, a propane tank, and a table (read more at <http://goo.gl/NivwT5>). —*Ilene White Freedman*

8 Heat up your canning jars when you're preheating water in your water bath canner. When your recipe is ready to can, remove the jars from the pot and set them on a clean towel on the counter. There's no need to invert them, as any remaining water will evaporate. —*Marisa McClellan*

9 When you're ready to remove your jars from the water bath canner, first lay down a towel on the countertop. Otherwise, the piping-hot glass jars could crack on contact with the counter's cold surface. —*Leda Meredith*

10 If your seal after processing isn't good, you can reprocess any unsealed jars within 24 hours. Use new lids, and process the jars for the same length of time a second time. Alternatively, you could freeze the food, or put it in the fridge and eat it within the week. —*Eugenia Bone*

Equipment Education

Beginning preservers will need to invest in a few basic pieces of equipment. For acidic foods, such as most fruits, jams, pickles, and salsas, you'll at least need jars, lids, jar-lifter tongs, and a water bath canner with a canning rack. Take it to the next level with a pressure canner to can low-acid foods, such as stews, meats and most vegetables. I'm absolutely taken with my aluminum All American pressure canner (www.AllAmericanCanner.com), which can also be used for water bath canning. Here are a few more go-to gadgets to make home canning and preserving more efficient.

11 Top of the line is a digital scale that can handle large quantities as well as measure small amounts. A mandoline is a hand-powered cutting tool that cuts thin, uniform strips. —*Leda Meredith*

12 When chopping vegetables and fruits for salsas and such, take advantage of your food processor. First, chop the fruits and veggies coarsely by hand, and then chop finely using the pulsing action of the processor. Chop each ingredient separately to keep softer foods from turning to mush. —*Andrea Chesman*

13 One piece of equipment I've found invaluable for canning is my Squeezeo (www.SqueezeoStrainer.com), which is a large strainer tool that takes the place of a food mill for separating pulp and juice from seeds, skins, etc. The process is fast. I use my Squeezeo for tomato-preservation projects, applesauce and grape jam. You can purchase different screens for berries and stringy vegetables. —*Shelley Stonebrook*

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14 When cooking jelly, use a heavy-bottomed, stainless steel stockpot that's at least three times deeper than the level of the juice and sugar combined to accommodate the jelly bubbling up when boiling. —*Judi Kingry and Lauren Devine*

15 If you have the equipment needed to make jams, you've nearly got all you need to make jelly—just add a **jelly bag and stand**. Ladle the fruit into the bag, and let the juice drip for up to four hours. You can place the stand in the refrigerator overnight and finish the next day. (For crystal-clear jellies, don't squeeze the bag.) —*Cathy Barrow*

16 Your pressure canner can double as a **boiling water bath** for acidic foods. —*Leda Meredith*



A jelly bag and stand are extra tools for pro-level jelly making (left). Jams make delightful gifts (right).

Eyes Inside the Jars

Quality ingredients matter. The best ingredients are organic, fresh from the garden or local farmers market, and put up at peak ripeness. I supplement my garden harvests by buying crops in bulk during their high season and making a day of putting them up. Our experts weighed in on what goes into their canning jars.

17 To ensure tomatoes are acidic enough to safely can in a water bath, add 1 tablespoon of bottled lemon juice or a quarter-teaspoon of citric acid per pint jar of tomatoes. For quart jars, double those amounts. Bottled lemon juice has a consistent level of acidity that fresh lemons don't always have. —*Leda Meredith*

18 Choose pickling, canning or kosher salt when pickling. Unlike table salt, these salts are free of anti-caking agents, which can cause the pickling liquid to turn cloudy. Iodized table salt will also affect the appearance of your pickles. —*Eugenia Bone*

19 Pickling cucumbers pickle better than other cukes because they have thinner skin and crisper flesh than most "slicers." Try varieties of American pickling cucumbers, European picklers, Middle Eastern cukes or Japanese types. —*Andrea Chesman*

20 To reduce foaming on the surface of soft spreads during cooking, add up to a half-teaspoon of butter to a soft-spread recipe before cooking. —*Judi Kingry and Lauren Devine*

21 Infuse pickles and preserves by making a spice bag instead of leaving whole spices in your final product or settling for the cloudy brine caused by powdered spices. Cut a 6-inch square of muslin fabric, and place your spices in a heap at the center of the cloth. Gather up the edges and tie them into a pouch with

cotton string. Remove from the pot before you ladle the spiced food into jars. —*Andrea Chesman*

22 Reclaim the waste skins and cores from apple-based recipes by making homemade pectin. Combine 2 quarts peels and cores (or whole apples cut into 1-inch chunks) with 2 tablespoons lemon juice in a large pot. Add water to partially cover, and then bring the ingredients to a boil. Reduce the heat and simmer, stirring occasionally, until the cores become mushy (about an hour). Pour into a cheesecloth-lined colander, and let drain overnight. The next morning, boil the thick liquid that has drained out until it's reduced by about half. You'll end up with about a pint. Store any pectin you won't use right away in the freezer, or can it in a boiling water bath for 10 minutes. —*Leda Meredith*

23 Some garlic will turn blue or green when canned in brine. There's nothing wrong with it! —*Cathy Barrow*

RESOURCES

Many of these canning tips came from the following titles, available on Page 64.

Ball Complete Book of Home Preserving

by Judi Kingry and Lauren Devine

The Feast Nearby by Robin Mather

Independence Days by Sharon Astyk

The Pickled Pantry by Andrea Chesman

Preserving by the Pint by Marisa McClellan

Preserving Everything by Leda Meredith

Mrs. Wheelbarrow's Practical Pantry

by Cathy Barrow

Well Preserved by Eugenia Bone

On the Clock

If you've heard canning is a lot of work on a hot day in a cramped kitchen—well, that's sometimes true. But you can save time and sweat upfront with a few clever canning ideas and a little planning.

24 Chuck a glut of tomatoes into the freezer to be canned later. Those frozen tomatoes will make great canned sauces, in part because they're so easy to peel—just rinse the skins off under running water. —*Robin Mather*

25 Learn to multitask. Start jam while dinner is simmering by popping prepped fruit mixtures into the refrigerator to macerate overnight. The next

night, process the jam while dinner sizzles on the grill. The time investment will pay you back all year long. — *Cathy Barrow*

26 After blistering whole peppers on the grill or under the broiler, put them into bags in the freezer. At a later date, pull them out and run water over them. The blackened skins will then slip off more easily. — *Joy and Robert Lominska*

27 I prefer to can in small batches. The food cooks quickly, especially if you use wide pans, and preserves can also be lower in added sugar than conventional recipes because you don't need as much sugar to support the set. — *Marisa McClellan*

28 I cook for one, so I usually make a full recipe of whatever I'm preparing and then end up with a gallon or more extra. After I eat one meal, I can the leftovers. — *JoAnne Grandstaff*

29 Many of the nutrients in produce are located in the peels. When making applesauce or other similar dishes, consider skipping the peeling instructions and instead use a blender to make the sauce from the skins along with the pulp. (If our ancestors could've used blenders, I'm betting they, too, would have tapped this timesaving method.) — *Cheryl Long*



If your pantry is jammed with sweet spreads, enjoy the surplus as a crowd-pleasing topping for brie and other mild cheeses.



Waste Not, Want Not

You have two opportunities to limit waste when canning and preserving: First, while you're canning, and second, after the food has been stored in your pantry. If you end up with a stack of jams to use up, consider savory applications, such as a glazing for pork or chicken. What follows are even more mouthwatering canning ideas to make the most out of your home-preserved foods.

30 Go "shopping" in your pantry and freezer to plan pantry meals for the week to come. — *Robin Mather*

31 When canning spiced apples or apple pie filling, use leftover spiced juice to make a granita. Add more sugar and orange juice to taste, and then freeze, breaking up the ice crystals with the tines of a fork over the next couple of hours. — *Eugenia Bone*

32 Save apple cores and peels to make apple-scrap vinegar for cooking (but not for food preservation). For 1 pound of cores and peels, dissolve 2 to 3 tablespoons of sugar in 2 to 3 cups non-chlorinated water. Put the apple scraps into a nonreactive bowl, and pour the sugar water over them. Cover with a towel and let sit at room temperature for a week. Stir the ingredients at least once a day. After a week, strain out the fruit. Keep the liquid at room temperature, stirring at least once a day for two weeks to a month, and always keep the bowl covered loosely with a cloth. When the taste is to your liking, transfer the vinegar to bottles. — *Leda Meredith*

33 Press tomato peels, seeds and solids through a mesh strainer to create tomato water. Use it to make a tomato martini or a vegetable broth, or to cook rice. You can also dry tomato peels on a parchment-lined baking sheet in a 200-degree-Fahrenheit oven for a couple of hours. Blitz the dried peels in a blender and sprinkle liberally on salads, eggs, sauces or hummus. — *Cathy Barrow*

Jennifer Kongs is the Managing Editor of MOTHER EARTH NEWS. Thanks in part to her grandparents' example, she has become a passionate proponent of home food preservation.

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Circle #18; see card pg 81





A RENEWABLE HOME ENERGY RETROFIT

How We Did It



The New England-based company ReVision Energy installed the Davis's ground-mounted, 39-panel solar array, which provides enough electricity to power their home and their all-electric vehicle.

Who says the retired life isn't energizing? By incorporating a variety of renewable energy systems into our Maine home, we now produce nearly all of our power without fossil fuels.

By Ron Davis

When my wife, Lee, and I retired in 2003, we resolved that one of our primary projects would be to significantly slash our consumption of fossil fuels by converting to renewable sources of energy, as well as by making our home more energy-efficient. This objective arose out of our

awareness of the terrible environmental impacts of fossil fuel extraction, processing and transportation, and also of the pollution and climate change caused by the combustion of these fuels.

Lee and I live on the outskirts of Orono, Maine, a town of about 10,000 in the south-central part of the state. Our 2,200-square-foot, single-story home sits along a dead-end country road, near the top of a gentle slope at the head of a hayfield. It's sheltered by forest on one side and a row of evergreen trees on the other, with our 60-by-20-foot vegetable garden tucked just behind the house. We've lived here for 42 years, and we enjoy our solitude, with our nearest neighbor about half a mile away. We have rather mild summers and pretty frigid winters, but, happily, the sunny days typically outnumber the overcast days.

Before retirement, I'd worked at the University of Maine for 33 years as a professor of biological sciences. I got involved in the environmental movement as a graduate student in the 1950s, and, through my activism, I picked up a bit of knowledge about alternative energy options. On a practical level, though, getting a grasp on home-scale renewable energy took patience and a great deal of learning. I consulted a lot of people—both folks at energy-related companies and other homeowners in the vicinity who'd installed systems—asked a lot of questions, and dedicated time to researching. Lee and I decided to put a substantial part of our savings and retirement income toward these home energy projects, but we didn't dream back when we first got started that we'd eventually be able to power our home and our local transportation almost entirely with renewable energy. (See how our energy systems fit together in the diagram on Page 34.)

Embarking with Wood

We set out on our journey in a small way well before retirement by supplementing with wood heat to decrease our fuel oil use. We added a small woodstove in our living room, as many Mainers do. To distribute the woodstove's warmth to other parts of the house, I installed an oscillating fan high on the living room wall, which pushed the rising hot air out into both corridors leading to the rest of our abode.

By burning approximately 1 cord of oak per year, we had a pleasantly toasty living room, and our fuel oil use dropped by about 20 percent, for an annual savings of about \$350 after fuel wood and electrical costs (for the fan). In recent years, we've had to cease running the woodstove, because hauling firewood is no easy feat at our age (I'll be 84 in August), but heating with wood offered a good introduction to tapping renewable energy, as well as to the concept that energy doesn't arise from nothing—it takes work.

Segue into Solar

Up until 2007, the same oil furnace that heated the house also handled heating our hot water. That year, we took our first major leap in our home's renewable energy retrofit by installing two solar collectors on our roof's south-facing side for heating our water. The collectors are Apricus brand, and each consists of 22 evacuated tubes (see photo on Page 32). The collectors absorb the sun's energy to heat a fluid circulating in a pipe that connects through our roof to an 80-gallon Stiebel Eltron hot water storage tank. The



The two solar collectors on the Davis's roof use "evacuated tube" technology, which better harnesses and retains heat compared with flat-panel collectors.

fluid circulates down to the heating coils in the tank, which resides in our basement.

Despite the hefty capacity of the tank, periodic spells of prolonged cloudiness or multiple guests taking showers at the same time have depleted the hot water supply on rare occasions. A small percentage of our water heating has thus continued to require fuel oil. Nevertheless, we've saved an average of about \$875 a year on water heating, and the net cost for the whole setup, after a rebate from Efficiency Maine—the state agency in charge of energy-efficiency and renewable energy programs—was \$8,395, for a payoff period of about 10 years. We're now only about two years away from recouping that investment.

Limiting Leaks

About the same time we were getting our feet wet with solar water heating, we arranged to have an energy audit of our then-35-year-old house. We wanted to identify where it was losing the most heat in winter, as understanding how we could conserve energy seemed wise before we dived into generating our own. A licensed energy auditor performed the service for about \$300. We discovered our home was letting out a lot of heat, primarily through the main-floor ceiling and around the top of the foundation.

With the audit results in, the sealing and insulating commenced. Lee and I don't use our attic, so, in 2008, we added about 2 feet of additional blown fiberglass insulation over the attic floor. (Before, we had just the standard 6 inches of fiberglass batt insulation atop the floor.) This increased the main-floor ceiling's R-value from about 20 to 60, and we immediately felt the difference. In 2010,

we added 3 inches of foam insulation along the underside of the basement ceiling and down the insides of the concrete foundation to 2 to 3 feet below the exterior soil surface. Both the basement and the main floor became noticeably warmer in winter. The cost of all of this work (not including the energy audit) after Efficiency Maine rebates was \$2,407. Calculating the payback period for these projects is a bit tricky, because, in the midst of them, we switched to geothermal home heat, and we later began generating

our own electricity, but our average monthly heating bill dropped about \$70 that first winter after both projects had been completed.

Going Geothermal

In 2009, we did away with most of our remaining fuel oil use by installing a geothermal heating and cooling system. We were drawn to geothermal because, for an existing home, there's a limited number of ways to get heat that don't involve fossil fuels, and for us, geothermal was the least expensive and most efficient of those options. Our geothermal system—designed and installed by Elco Electric of Bangor, Maine—consists of a 6-ton-capacity ClimateMaster heat pump in our basement, and a horizontally configured heat-exchange pipe beneath the ground.

About 6,000 feet of polyethylene pipe, coiled like a stretched slinky into three 200-foot-long, 6-foot-deep trenches, extends under the hayfield in front of our house (see photo on Page 34).

Two small electric pumps in the basement circulate an antifreeze solution throughout the underground pipe system and to the heat pump. In the heat pump, heat gets extracted from the solution to warm the house in winter, and heat from the house is added to the

Early on, we arranged for an energy audit of our home so we could take steps to conserve energy before starting to generate our own.

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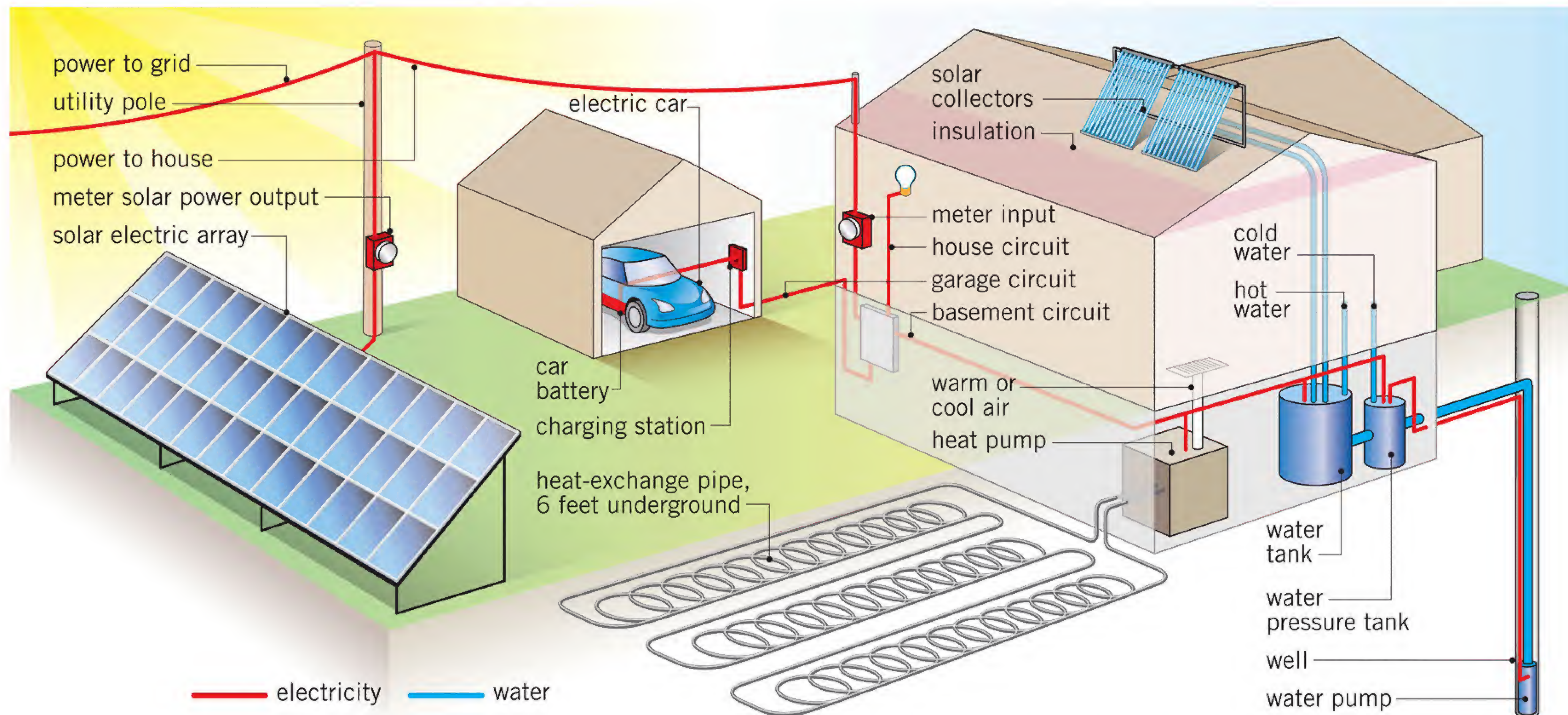
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Employing their home's roof and basement, their hayfield, and even the earth beneath their property, the author and his wife have implemented an assortment of renewable energy retrofits: solar hot water, geothermal home heating and cooling, and solar electricity for both their home and electric car.



A combined 6,000 feet of heat-exchange pipe stretches through three 200-foot-long trenches to capture geothermal energy.

solution to cool our living quarters in summer. By pumping the solution through the buried pipe, this heat is transferred from or to the ground based on the season. From the heat pump, the heat gets transferred to or from a forced-air ventilation system, heating the house in winter and cooling it in summer. The heating phase pulls the heat stored in the ground during the warm span of the year, so, fundamentally, this is a solar system, and it has furnished all of our heating and cooling since installation.

After installing the heat pump for our geothermal system, we connected it to our hot water system to use waste heat from the pump's operation to supplement water heating. Since our geothermal system went into operation in August 2009, we've used only about 50 gallons of fuel oil per year for backup water heating during cloudy periods, and for when we have a bevy of visitors. The net cost for the geothermal system after an Efficiency Maine rebate and a federal tax credit was \$25,495. We've saved \$2,800 annually on fuel for heating the house and our water (not factoring in the extra electricity cost to run the heat pump, which we eliminated in 2012 when we started producing our own electricity), so the payback period will be just a little more than nine years.

A horizontal layout of heat-exchange pipe like ours isn't for everyone interested in geothermal. We have enough land with deep enough soil by our house to accommodate the system. Homeowners with less land or with soil that's too shallow can instead drill deep wells to house the heat-exchange pipe.

In the years since we installed our geothermal heat pump, ductless mini-split heat pumps have become available for supplemental heating and cooling. With these air-based pumps, the heat exchanger is typically mounted outdoors on the residence and is ducted to an interior, wall-mounted unit. Such systems are designed to heat smaller spaces than our full house—they're effective for heating spaces similar to those that would be heated by a wall-mounted propane heater, with the added bonus of being able to cool the air during summer. They are electrically powered, and

more energy-efficient and cheaper to run than propane heaters, yet they're not as efficient as geothermal systems in cold, lingering winters like Maine's.

Greener Electricity

Although our geothermal system put an end to almost all of our fuel oil purchases, it increased our electricity usage by about \$1,000 per year, and most of that electricity from the power company was being produced with fossil fuels. In the summer of 2012, we took another leap by putting in solar photovoltaic (PV) panels to produce our own electricity. We installed a 9.36-kilowatt (kw) array made up of 39 PV panels from Canadian Solar. Based on our history of electricity use and taking into account our area's sunshine-to-cloudiness ratio, we calculated that this 9.36-kw array would be sufficient to supply all of our household needs, including powering the heat pump and charging an all-electric car for 7,000 miles of local travel per year (more on transportation on Page 36).

As the south-facing side of our roof was inadequate for an array of this size and was already partially occupied by our solar hot water collectors, we opted to place a free-standing PV array in the hay-field in front of our house. The entire cost of this installation was \$28,790 after an Efficiency Maine rebate and a federal tax credit. In the first two years with the array, we saved an average of \$2,400 per year in electricity purchases. At that rate, earning back the installation cost will take us 12 years from September 2012. If the power company's rates go up, the payback period will be shorter.

How Our Solar Electricity Setup Works

Producing solar electricity is complicated by the fact that the sun doesn't always make an appearance. One way to address this potential pitfall is to install a bank of large storage batteries. They charge when the sun is shining, and you can then draw electricity from them whenever skies are gray. These batteries are expensive, but this is the only option for homes in remote locations off the electrical grid. In contrast, our solar array is "grid-tied," meaning it's connected to the power line by our house, and we co-generate electricity with the power company. We meter our solar electricity output to the grid, and separately meter the electricity we draw from the grid at our house. When we contribute more kilowatt-hours (kwh) than we consume, as is the case from about April to October, the power company credits us for the excess kwh. When we use more than we produce, which happens from November through March, we use up our earned credits.

Our goal was to make our free-standing solar array just large enough that, over the course of a year, we wouldn't have to buy electricity from the power company. We estimate that, with the electric car, we'll use about 11,000 kwh of electricity per year. In its first two years of operation, the array delivered approximately 12,000 kwh of electricity per year. With the recent addition of an electric car, we'll need another year of experience to see how close we've come to meeting our goal of purchasing zero electricity.

A Look Back—And Forward

Rebates from Efficiency Maine and residential energy tax credits from the federal government substantially reduced costs as we



Master Electrician Ryan Herz of ReVision Energy secures wires on the back of the Davis's solar array, which sits on a 43-foot-wide rack. Below: Ron, Lee and their dog, Gingah, enjoy energy independence — even when snow is piled high!



tackled all of these home energy retrofits. In the years since we began installing our energy systems, some of the prices have come down, and low-interest financing is now available for some of them, making a foray into renewables possible for younger homeowners and others who may lack financial resources we had.

I must admit that our transition away from fossil fuels isn't complete. Much of what we buy—including a great deal of our food and even the energy-saving equipment we've installed in our home—is produced and shipped using fossil fuel energy. We can and will take further steps to wean ourselves off fossil fuels, but life altogether independent of them may not be possible in our

economy without full withdrawal from it and a return to the kind of lifestyle that existed before the Industrial Revolution. Lee and I are incredibly pleased, though, with what we've accomplished. Reducing our carbon footprint has been a major emotional boost for us. We value knowing that our home is powered by solar energy that we, ourselves, collect, and that the good Earth shares its heat in winter and accepts our heat in summer by way of our geothermal system. Many people in our community have visited our home to check out our systems and ask us questions as they get started taking steps to cut their own carbon footprints. It's immensely gratifying to be that example for others. 🌳

A Transportation Transition, Too

Our shift away from fossil fuels wouldn't have been complete without addressing our vehicle use. Public transportation isn't a viable option for us here at our rural location, and with our volunteer work and involvement in different community projects, Lee and I want the freedom and convenience of having separate cars.

In 2010, we owned a 1987 and a 2002 Toyota Corolla, both getting about 30 to 35 miles per gallon. That year, we replaced the 1987 car with a new Toyota Prius. With this hybrid car, we've achieved about 49 mpg in winter and about 52 mpg in summer. As with any vehicle powered entirely or in part by gasoline, mpg depends on many factors, including driving style. It takes practice, but we've found that slow acceleration, coasting to stops and timing traffic lights to avoid full stops (when traffic allows), and consistently staying within speed limits considerably ups gas mileage.

Since buying the Prius, we've purchased about 850 fewer gallons of gasoline than we would have needed to get around in the old Corolla, saving about \$3,000 (at 2013 gasoline prices) and emitting much less carbon dioxide and other pollutants into the atmosphere. We predict that by the end of 2015, we will have recouped the price difference of a new Prius over a new Corolla by our reduction in gasoline purchases, even with the recent drop in gasoline prices.

In 2013, we were still burning about 300 gallons of gasoline annually between our two cars, and by that November, we were ready to replace our remaining Corolla. We sold it, purchased a new, all-electric Nissan Leaf, and installed a

240-volt charging station for the Leaf in our garage.

This car is a terrific fit for us because most of our local trips for shopping and other activities are within 10 miles (one way) of home. We now plan our excursions to minimize use of the Prius for local travel, and we've been able to use the Leaf for more than 90 percent of these short trips. The Leaf's average year-round range in our climate, between charges, is about 85 miles, and about 20 percent more in summer than in winter. Apart from that slight limitation, it's a silent joy to use. It's much simpler and cheaper to run than a gasoline-powered vehicle, as it has no exhaust system, no gas tank or tank fill-ups, and no engine oil to change or cooling water to monitor, and it's easy to plug in for battery charges. A full charge at our home station takes two to three hours, which we typically do overnight. At a quick-charge station, replenishing the battery takes only about a half-hour. The availability of a second

family car that can run on gasoline for the occasional longer outing imparts additional practicality to all-electric car ownership. We still rely on our Prius hybrid for such trips.

Since we purchased the Nissan Leaf in November 2013, we've bought only about 125 gallons of fuel for the Prius to cover trips to Massachusetts and the occasional simultaneous use of our two cars. The cost of the new Nissan Leaf plus charging station, after subtracting the sale proceeds of the old Corolla and receipt of a federal tax credit, was \$25,804, or about the same cost of a new Prius. The zero-emission Leaf is far superior economically, however, because it's much less costly to run per mile.

Our vehicles' fuel cost per 1,000 miles

Nissan Leaf (electric).....	\$1.50
Toyota Prius (hybrid).....	\$58
Toyota Corolla.....	\$94



Lee and Ron have dubbed their 2013 Nissan Leaf the "Suncar," as they're able to fuel virtually all of their local transportation in it with energy seized from the sun.



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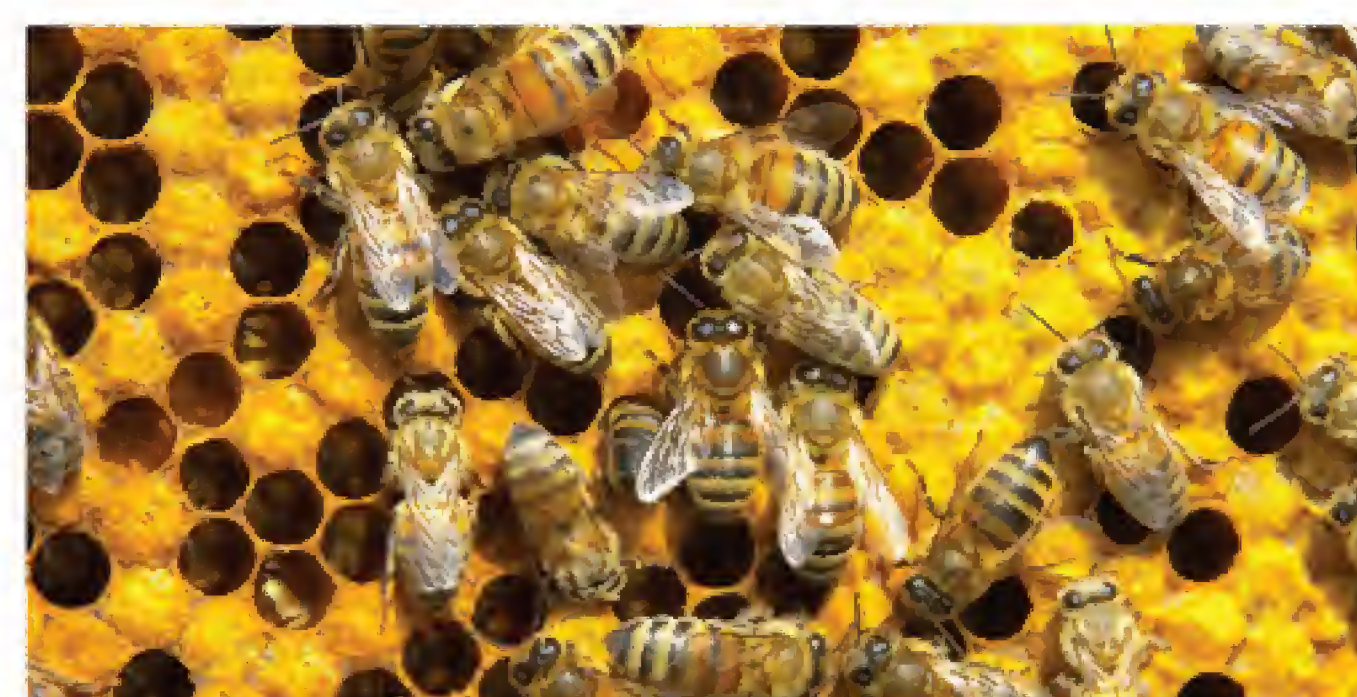
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AVOID COMMON GARDENING MISTAKES

With these pointers, gardeners just getting their trowels dirty can sidestep six classic food-growing faux pas.

By Barbara Pleasant

Just as there's no such thing as a perfect garden, there's no perfect *gardener* either. We all make mistakes, but, in doing so, we learn which ones never to repeat, and along the way we discover savvy strategies to add to our gardening routines. So, what are vegetable gardeners' biggest blunders? I've made each of the following six gardening mistakes, and after talking with thousands of organic gardeners, I know I'm not alone. Get a head start by learning from our errors instead of laboring through your own.

1 Tackling Too Much

Spring fever inspires big dreams among gardeners, and it's easy to forget that every planting requires a commitment to future maintenance. Before you know it, your springtime aspirations will have turned into an overwhelming summer reality—weed, water, thin, plant, prune, stake and harvest, all at once and for weeks on end!

If you're a novice gardener, you'll greatly enhance your chances of success by starting small with only a few rows or beds, allowing yourself to focus on each individual crop you're growing and better understand its needs. Instead of trying out 10 unique tomato varieties and every hot chili pepper under the sun, pick one or two of each and build your plant-care confidence.

Another smart idea is to limit the number of different types of veggies you tend in each part of your growing season (spring, summer and fall, in most climates). Vegetable plants need the most attention during their first month in the garden, so by having only three to four juvenile crops going at a time, you'll be able

to keep up without a hitch. For example, you might grow potatoes, salad greens and snap peas in early spring; peppers, squash and tomatoes in late spring through summer; and cabbage, carrots and spinach from late summer to fall.

To avoid taking on too much, some gardeners start by growing only in pots or containers, assuming this will be easier—but this often isn't true. A container limits the spread of roots (see illustration, Page 41) and the plants can easily become water-stressed and quite warm on hot days, while the same plants grown in enriched, mulched beds would enjoy consistently cool roots. The crops that grow best in containers are heat-tolerant plants, such as eggplant, peppers and tomatoes, which can take warm root temperatures as long as they're given a large pot and plenty of water. But even still, you may need to water container-grown crops twice a day during summer's hottest stretches, which is a major commitment. Comparatively, you'd only have to water plants in garden beds a few times a week.

Instant "bag beds" are a better no-dig option than containers (see illustration above), because, with this method, you cut slits in the bottoms of the bags so roots can move down into the soil below. Plus, the bags can be mulched to help retain soil moisture.

② Underestimating the Weather

Every climate is kind to some vegetables and cruel to others, which is why heat-loving okra plants are irrepressible



A nice option for newbies is "bag gardening." Simply cut out the top of a bag of soil, make slits in the bottom, and plant seeds.

in Memphis but struggle in Minneapolis. Choosing to grow crops that are adapted to your region is an excellent first step, but you will still need to take additional measures to protect plants from wild weather.

Springtime can be especially hazardous because beautiful, sunny days alternate with others that are cold or windy, or both. Placing milk jug cloches or row cover tunnels over spring seedlings will keep your plants' stress levels low, and, if you live in an area prone to storms, could shield your seedlings from getting pummelled by hailstorms, too. For some crops, row covers are an important step in pest prevention as well, so they'll do double duty for you as you become a more experienced gardener.

With warm-season crops, a common misstep is planting too early. You'll be better off waiting for warm weather to settle in and the soil to warm up than pushing for an extra-early start, because warm-natured plants will not grow in cold soil. Plants that need warm soil and weather include beans, corn, cucumbers, eggplant, melons, peppers and tomatoes. While you wait, you can plant any of these crops that do well in cool soil and can take a bit of frost: broccoli, cabbage, collard greens, kale, leeks, peas, radishes and spinach.

③ Misunderstanding Soil

Especially for beginners, soil may be the most mysterious piece of the gardening puzzle. In addition to serving as comfortable digs for plant roots (airy, friable and able to hold moisture), it needs to provide your crops with nutrients.

The sure path to better soil starts at your compost pile, which is why newbie gardeners would do well to dive into composting the same year—or even the year before—they jump into gardening. If you can dig about a 1-inch layer of mature compost into your soil every time you plant, your soil quality will steadily improve. These frequent infusions of organic matter have a neutralizing effect on soil pH and also support beneficial soil organisms, especially earthworms and mycorrhizal fungi.

Another big key to creating super soil: Don't skip the mulch. Mulching liberally with grass clippings, straw, shredded leaves or other biodegradable materials



Score bigger, better harvests by consistently improving your soil with organic matter.

will add even more organic matter to your soil over time. Plus, throughout the growing season, thick mulch will suppress weeds, hold in moisture, and help regulate soil temperature.

If you keep chickens, rabbits or other livestock, you can use their manure to make an organic soil amendment, too. To fully compost the manure, add just enough moisture and high-carbon organic matter (such as leaves or sawdust) to help it rot. Keep in mind that composted manure will retain more of its nitrogen if it's never leached by rain, so be prepared to store the finished product in containers or bags, or under a tarp.

4 Miscalculating Fertilizer Needs

Compared with animals, plants have skimpy appetites, because sunlight is their primary energy source. Yet plants do need three important nutrients—nitrogen, phosphorus and potassium—if they are to function as efficient photosynthetic factories. Dry organic fertilizers provide these and other important nutrients, such as calcium and magnesium, which are crucial for blemish-free tomatoes and sweet, thick-walled peppers.

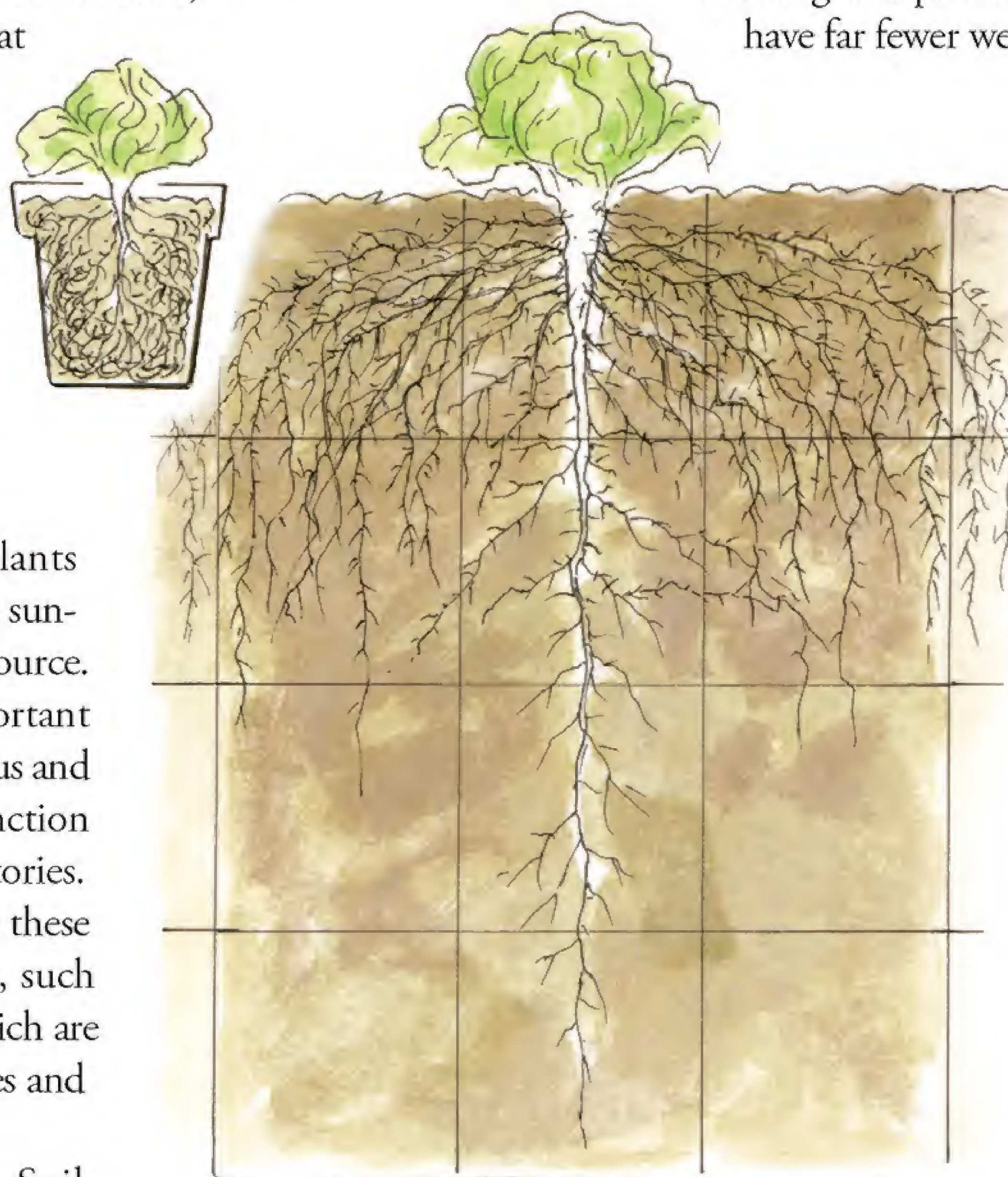
Don't overdo it, though. Soil-testing labs tell us gardeners apply too much fertilizer far more often than too little. In general, apply organic fertilizer at the rate recommended on the label, and mix it into the soil just before the crop is planted. As the growing season progresses, fertilize a couple more times—especially for long-season crops—ideally at a crop's first fruiting and again as you gather your first harvest. You can do this simply by spreading a strip of organic fertilizer, such as grass clippings or mature compost, directly alongside your crops—a technique known as “side-dressing.”

5 Crowding Your Crops

A young plant is a solar-powered being, and each new leaf is part of its expanding solar array. If plants grow too close together or are crowded by weeds, reduced sunlight and below-ground competition for water and nutrients can significantly stunt growth. This is why it's important to grow plants at the proper spacing when you're setting out seedlings, and to thin the crops you grow from seed, such as beets and carrots. Seed packets will usually tell you the optimal spacing. Thinning work is a bit painful, because you feel like you're killing half of your crop. Your harvests really will be

bigger and better in the end, though, because your little seedlings will have the room they need to thrive.

Of equal importance is owning a good hoe so you can weed early and often to keep unwanted plants from stealing your crops' sun, water and nutrients. Then, as blooms and fruits appear, it's best to rely on mulch to suppress weeds. If you do a good job of weeding and prevent any weeds from going to seed, you'll have far fewer weeds the following year.



The roots of crops grown in the ground, rather than in pots, can spread out and reach essential nutrients and moisture. Here, each box equals 1 square foot.

6 Inviting Critters

Wherever you garden, wild creatures are watching you work, waiting for their favorite meal to be ready. To find out which critters to expect, talk with neighbors about what kinds of wildlife are commonly seen in your area and what they like to eat.

In some parts of the Midwest, gardeners shy away from sweet corn because it invites raccoons, which will make off with cantaloupes, too. In Virginia, where I live, ground-hogs have been known to level gardens overnight, and the deer regard snap beans as candy. If you can't fence out animal pilferers, you can protect your crops with chicken wire cages, row cover tunnels, or even enclosures made of burlap or other cloth stapled to wood stakes. If animals can't see plants they'd like to devour, they're more likely to leave them alone. If all else fails, motion-

activated sprinklers that surprise invaders with a spray of water may help safeguard your garden.

Insect pests are sometimes even more troublesome than larger critters. Watch your plants closely for signs of pest damage, and lift up plant leaves to try to spot pest eggs on the undersides. Plus, plant some flowers! Most new gardeners are so enthusiastic about starting the journey to grow veggies that they skip planting flowers, or they relegate blooming beauties to “ornamental” areas of their yard. Instead, incorporate flowers into your garden plans from the get-go. Flowering plants draw in beneficial insects that not only boost pollination, but that actually *eat* crop-munching pests. 🌱

Award-winning garden writer Barbara Pleasant grows and preserves a bounty of fruits, vegetables and herbs in Floyd, Va. If you're a beginning gardener, we highly recommend her book *Starter Vegetable Gardens* (available on Page 64).

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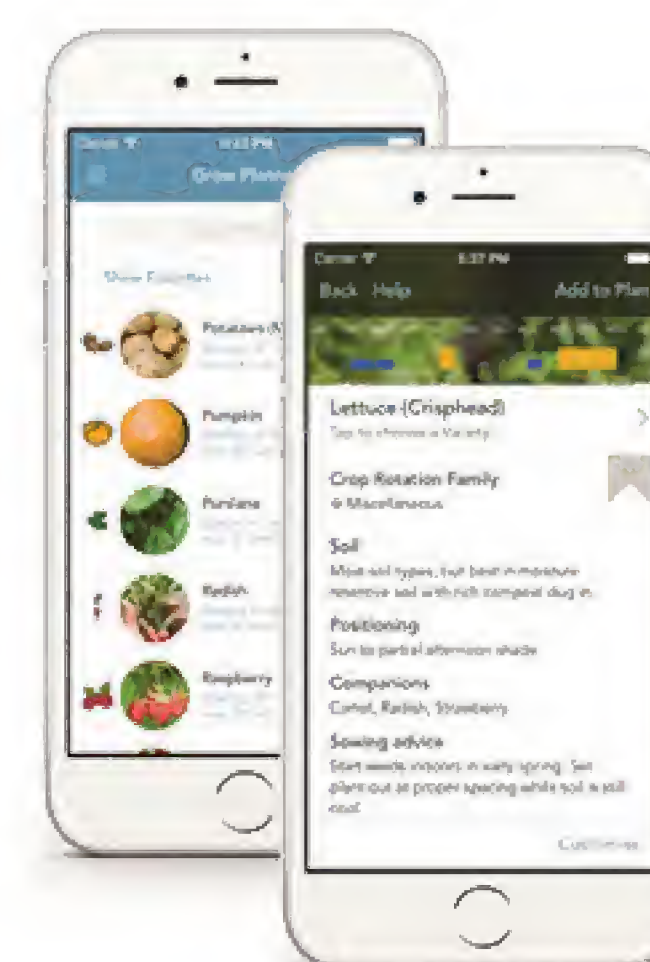
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Circle #66; see card pg 81

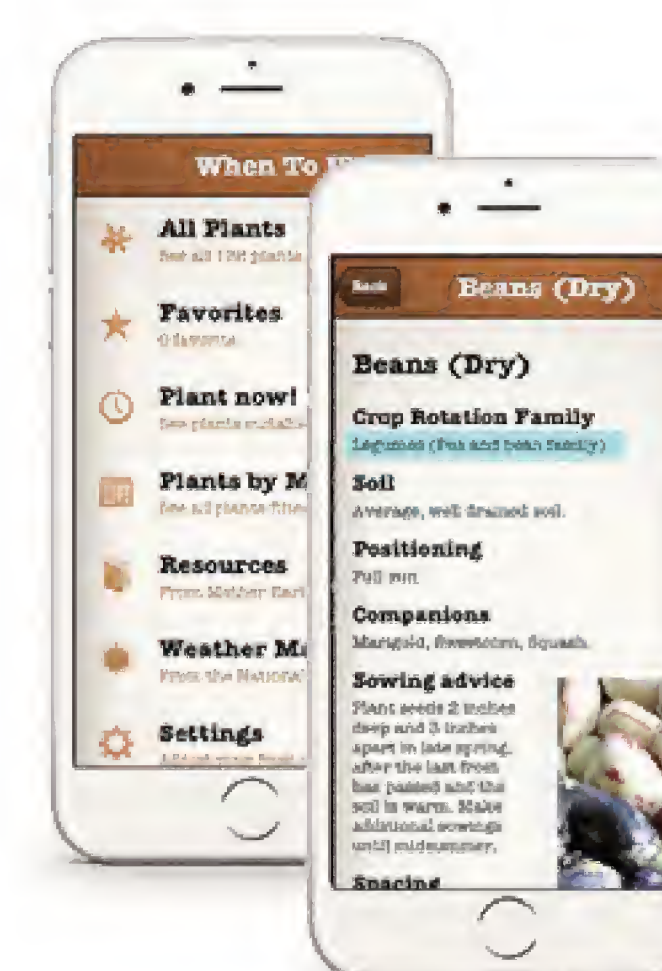
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DIY OUTDOOR COOKERS

You can build a fire pit or assemble a clay-pot smoker in just one weekend. Let's get cookin'!

By Spike Carlsen

Enjoy campfire cooking in the great outdoors without having to leave your own backyard by rustling up these two weekend projects: a homemade smoker and a DIY fire pit with a cooking grill. A backyard fire pit can be your family's favorite place for conversation, relaxation and cooking—and you won't have to limit the menu to marshmallows and hot dogs, because the pivoting, adjustable grate will expand your outdoor cooking options to include anything you'd try on a grill.

Or, if you'd prefer a simpler evening gathering spot, you can build only the fire pit ring without the cooking grate. You can also spend just a few weekend hours assembling this simple homemade clay-pot smoker.

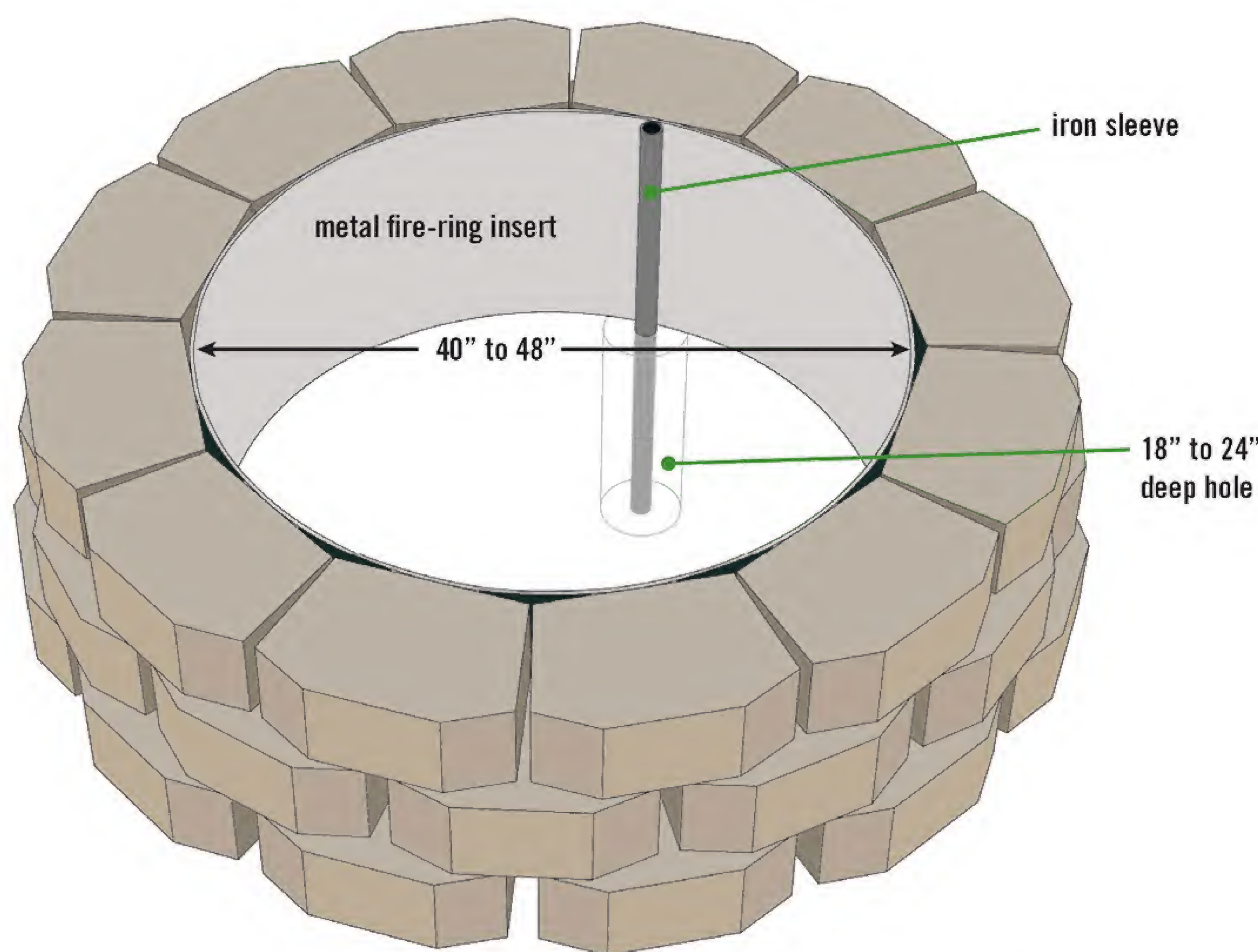
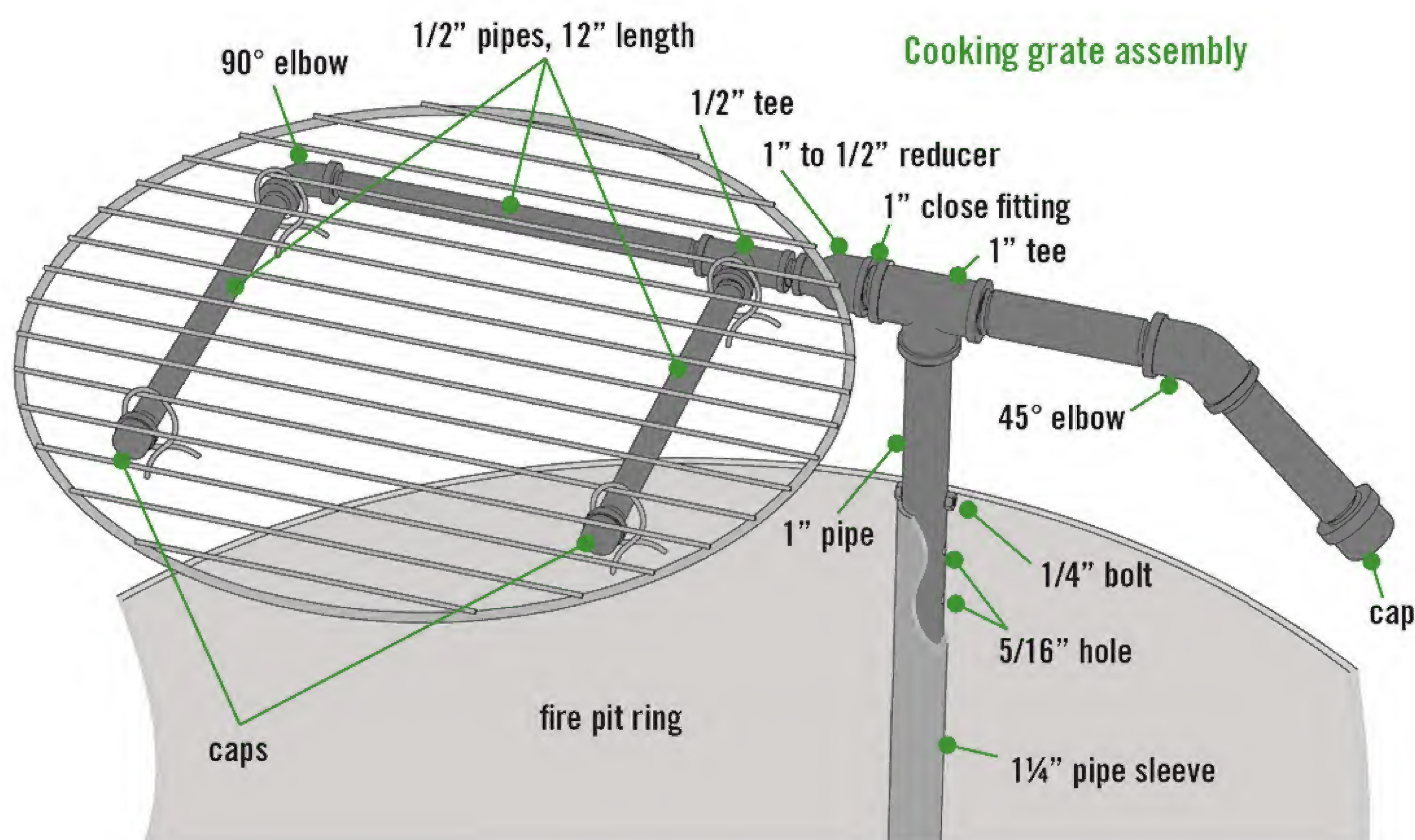
Fire Pit with Grill

1 Go shopping. Find the items on the materials list (Page 44). Buy a metal fire-ring insert at a home center, farm supply store or garden center, or create your own by cutting down a culvert or a 55-gallon drum. Select trapezoid-shaped retaining-wall blocks for the surround. To make certain they'll create a tight circle around your fire-ring insert, check the manufacturer's literature or lay out some blocks in the store. If you're building the metal cooking grate assembly, note that fittings and pipe sections with pre-threaded ends are available in a range of sizes. Use the "black iron" variety, because galvanized pipe can emit harmful fumes when heated.

2 Lay out the site. First, determine the overall dimensions of the fire pit by adding the diameter of the fire-ring

insert and the width of the retaining-wall blocks. Pound a stake into the ground to indicate the center of the ring. Hook one end of a tape measure on a nail driven into the stake, and use it as a gigantic compass to scratch two circles into the ground: one to inscribe the circumference of the metal fire-ring insert, and the other to inscribe the outside circumference of the blocks. You can also mark the perimeters with stakes. The area between the circles is where you'll need to excavate in Step 3. If you prefer, you can dig out a much larger area to create a firebreak between your fire pit blocks and surrounding vegetation, and to give you space to create an easy-to-level gravel surface on which to set benches and chairs.

3 Excavate the area between the circles to a depth of 6 inches. Add 4 inches of gravel. Even out the gravel



Fire Pit Materials

Retaining-wall blocks, 10 to 20 per course
1 metal ring insert for a fire pit, 40\"/>

For cooking grate assembly

Black iron pipe and fittings—length and number will vary according to grate size
Concrete mix
1 cooking grate
Wire
1 bolt, 1/4\"/>

a level to make sure the first course of blocks is level. Add a couple of inches of gravel along the outer perimeter of the first course to lock the fire pit's blocks in place and to bring the gravel fill up to ground level.

8 Apply concrete block adhesive to the top of the first course of blocks. Position the first block of the second course so it's centered over a joint between a pair of blocks below. Add the remaining blocks for the second course. Keep adding courses to reach your desired height; three or four courses are typical for backyard fire pits. Some retaining-wall systems include cap blocks to create a more finished look for the top course. Determine ahead of time whether you want to install cap blocks; if you do, then take them into account when calculating your fire pit's final height.

Clay-Pot Smoker

1 Purchase materials. Follow the materials list on Page 45. Because you'll acquire parts to build this homemade smoker from a variety of sources, measure as you go and purchase the parts in the following order:

- **Electric hot plate.** The smaller, the better, but make sure it runs on at least 1,000 watts to maintain the temperature required for smoking meats.
- **Clay pot.** The bottom must be large enough to accommodate the hot plate and control knob, with a little room to spare.

using a level taped to a long, straight 2-by-4. If you don't intend to build a cooking grate, skip ahead to Step 7.

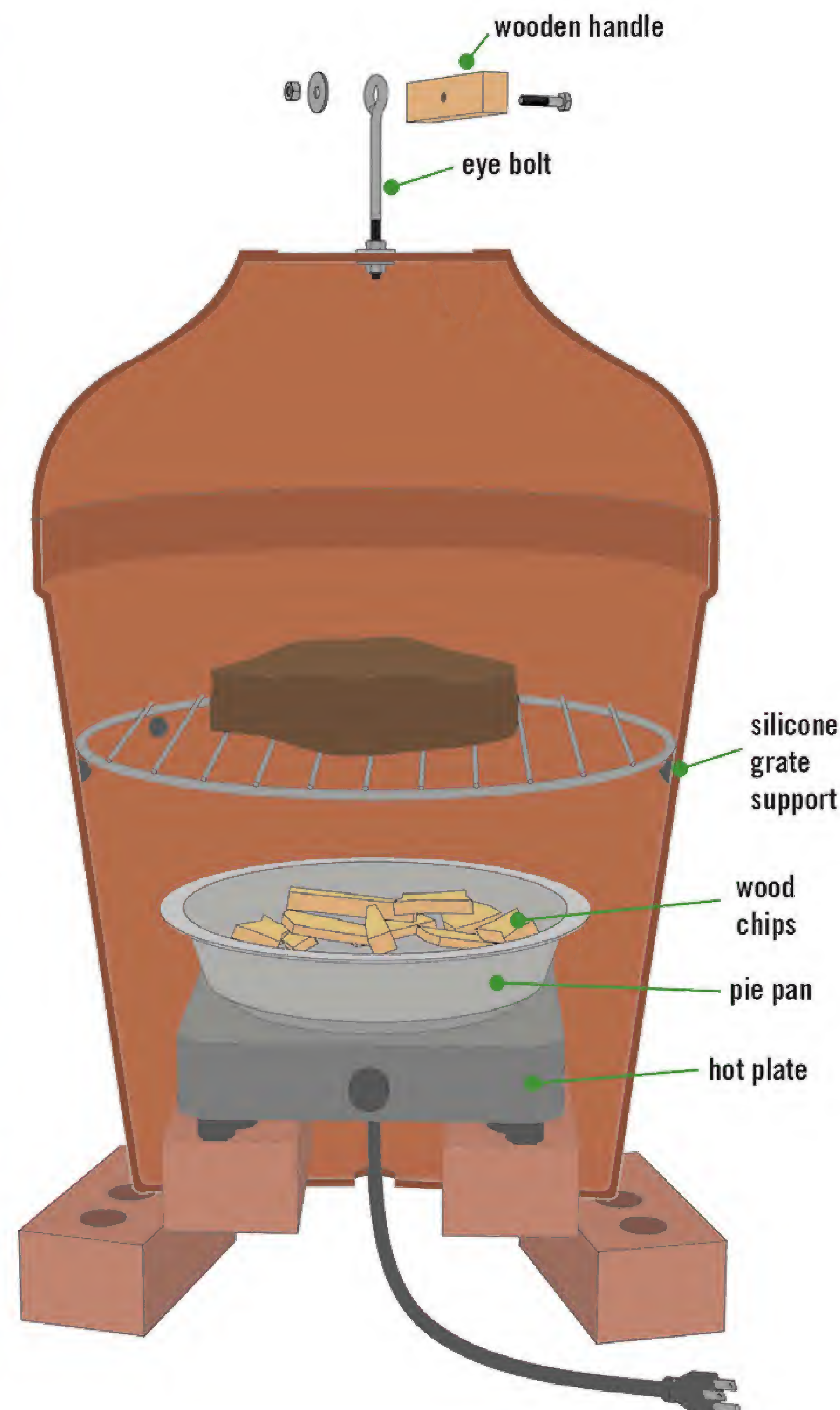
4 Dig a hole. Use a posthole digger to dig a 6- to 8-inch-diameter hole that's 18 to 24 inches deep for the iron pipe sleeve that will support the cooking grate assembly. The ideal position for the pipe sleeve is just kissing the inner surface of the metal fire-ring insert, as shown in the illustration above. Insert the pipe sleeve so it's level with the top of the metal fire ring (or slightly taller) and stands perfectly plumb. Mix and pour the concrete to fill the hole around the pipe; keep the top of the concrete just below the soil surface so it won't interfere with the metal fire ring and blocks when you install them.

5 Build the pivoting cooking grate assembly. Use standard iron pipe and

fittings, as shown in the cooking grate assembly drawing above. Thread the parts together and tighten all the joints firmly with pipe wrenches. (You can fiddle with the size and design to match your site and cooking needs.)

6 Install the grill. I used a 22-inch replacement grill and wired it to the arms of the assembly in four places. Make the cooking grate's height adjustable by drilling a few 5/16-inch-diameter holes spaced 2 inches apart near the bottom of the pipe leg. Use a 1/4-inch bolt to peg the height you need.

7 Position and level the metal fire-ring insert. Set the first course of retaining-wall blocks around the perimeter of your fire pit. If the last block doesn't fit, pull each block an inch or so farther away from the metal insert and try again until the blocks form a full circle. Use



Make a smokin' smoker: Accessorize a clay pot with a grate, hot plate and a lid.

- **Grate.** You can find a grate at hardware stores or online. The one you choose must be of the right diameter to nestle inside your clay pot about 1/4 of the way down the sides.
- **Cover.** Find a pot tray or a clay pot that will fit over, inside of, or directly on top of the lip of the larger pot. The cover should create a decent seal and not be prone to sliding off the larger clay pot.
- **Handle.** Make sure the handle assembly hardware will work with the cover you chose.

2 Drill a hole. Use a masonry or glass-and-tile bit to drill a hole—or enlarge an existing hole—in the bottom of the large clay pot for the hot plate's electrical plug to pass through. To minimize the chance of damage as you drill the hole, cradle the pot on a bag of sand for support.

3 Assemble a handle for the lid. Use the eye bolt, bolt, washers, nuts, and a 6-inch length of wood or wood dowel. Drill a hole in the bottom of the clay cover for the handle assembly (see illustration above).

4 Test-fit the parts. Position a few 2-inch-thick brick or patio block scraps inside the pot to prop up the hot plate for air circulation. Place the pie pan for wood chips on top of the hot plate, insert the cooking grate, and then add the cover. When everything fits, you'll be ready to start smoking. Prop the pot on three bricks or patio blocks. If your cooking grate wobbles or tilts, create three support lips for the grate to rest on using dabs of silicone caulk on the inside of the larger pot.

5 Get smokin'. Position the smoker outdoors on a noncombustible surface in a sheltered area. On the trial run of my homemade smoker, a 5-pound brisket took 4½ hours to get to the recommended internal temperature of 180 degrees Fahrenheit. Some trial and error will be required to find the hot plate setting that will keep your DIY smoker within the desired temperature range—between 210 and 220 degrees. Use gloves to handle the hot components of your smoker, and keep curious kids and pets away from the designated smoking area. 🌿

Smoker Materials

Electric hot plate, 1,000 watts or greater

Clay pot, 12" to 16" diameter

Smaller clay pot or tray for lid

Circular cooking grate, sized to pot interior

5 to 7 pieces of 2"-thick brick or patio block scraps

Metal pie pan

Oven thermometer with range up to 220 degrees Fahrenheit

For handle assembly

1 eye bolt, 3/8" or 1/2" x 6", with 2 washers and 2 nuts

1 bolt, 1/4" x 2", with washer and nut

1 wood dowel for handle, 6" long

Spike Carlsen is a carpenter, editor and author who cooks up fun in Minnesota. These projects are from his excellent DIY book *The Backyard Homestead Book of Building Projects*, available on Page 64.

TOP TOOLS

for a Half-Acre Homestead

DIY veteran Lloyd Kahn recommends the tools and tactics that have kept his homestead humming for 40 years.


By Lloyd Kahn

Summon the word “homestead” and you likely think of hardy farmers with 10 or more acres on which they keep livestock, grow and preserve a great deal of their own food, and fell trees to build their homes. But more modest-sized homesteads are more attainable for most people, and these smaller-scale acreages can embody old-school homesteading in principle, if not in scope. Our small homestead is one of those. For the past 40 years, my wife, Lesley, and I have lived in a house we built ourselves, and we grow a lot of our own food on our half-acre of land.

We began our homesteading lifestyle in the '60s and '70s, when the counter-cultural revolution was sweeping across the United States. The '60s meant many different things to many people, but for me, the focus was on food and shelter. By building our own house, we could escape rent and mortgage payments. In 1971, we bought our half-acre of land (two 100-by-100-foot lots) for \$6,500 in a small town in Northern California.

I built our current home (below) with used lumber from torn-down

Navy barracks. I salvaged the windows from chicken coops in a nearby town and picked up the doors from debris boxes outside remodeling projects in San Francisco. I covered the exterior walls with shakes I split from redwood logs that had washed up on a nearby beach. Concurrent



Redwood shakes sheathe the exterior of Lloyd's home, and fiberglass on the roof forms inexpensive skylights.

with the construction, we planted fruit trees and a large vegetable garden, and got chickens, bees and goats.

Between then and now, our half-acre homestead has gone through continuous changes. I learned long ago that you probably can't become fully self-sufficient, but you *can* work meaningfully toward greater self-sufficiency. You can grow as much of your own food and do as much of your own building as possible without fixating on doing it all. After four decades of embracing this mindset, I've discovered that you'll certainly

get much further down the road to self-reliance if you have the right high-quality tools for the tasks that will arise along the way. Following are some of the tools and techniques that have made Lesley's and my 40-year journey toward greater self-sufficiency successful. As comic book character Mr. Natural said, "Get the right tool for the job!"

Build the Basics

Chicken coop. I built about five make-shift coops and lost quite a few hens to predators before deciding to construct a

proper coop (see Page 48). We poured a concrete slab, put up conventional walls, and protected the yard with aviary wire, which we sank about 18 inches into the ground all the way around. The new coop has successfully kept out hawks, rats and digging critters, such as raccoons. It also has a living roof.

Greenhouse. Its north wall is made of stabilized adobe bricks (1 part cement to 12 parts soil). The other three walls are





recycled windows that were free. With the greenhouse roofing, trial and error prevailed. The first roof was made of corrugated vinyl sheets from Home Depot, and after a few years, they became discolored—horrible stuff. I replaced them with greenhouse-grade fiberglass, and within six years, it too had become discolored from road dust and lichen, causing the plants inside to grow too leggy. The greenhouse's present roof is twin-walled polycarbonate, a wonderful (though expensive) glazing material (from www.FarmTek.com) with a 10-year guarantee. We also installed a solar-powered fan for cooling.

Raid-proof garden beds. Gophers are a problem in our area,

so Lesley laid quarter-inch wire mesh on the ground where we wanted each garden bed, and then dry-stacked two layers of concrete blocks on top around the edges of the wire. We then filled the bed and blocks with soil and—*voilà!*—we had gopher-proof vegetable beds.



Compost system. We've found that keeping two compost buckets works well—a 1-gallon bucket by the sink for food scraps we'll feed to our chickens, and a 3-gallon bucket with a foot-operated lid for the rest of our food scraps, such as orange peels and coffee grounds.

In the garden, I built three 5-by-5-foot bins, each about 5 feet high, with sliding boards in front that I can adjust according to the pile's height. We mix in food scraps from the foot-operated bin, grass cuttings, seaweed, topsoil, and manure and bedding straw from the chicken coop, and keep adding, mixing and moving the compost from bin to bin until it has matured.

Tin roofs for outdoor storage. Our entire property is fenced to keep out deer and dogs. On many sections of fence, I've formed roofs out of recycled, heavy-gauge corrugated metal sheets to create

Succulents add charm to the roof of the coop without requiring much care (top).

Raised beds and wire keep gophers at bay (right). Salvaged materials form a funky, functional greenhouse (below).



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covered areas for tool storage, firewood and more.

Lumber racks. To compensate for limited storage space, I've built racks so I can stack lumber five tiers high.

Hearthstone woodburning stove. This 35-year-old woodstove is our only source of heat (though we also rely on the age-old principle of layering clothing). I get wood from trees that topple on or alongside nearby roads, and once a year I rent a log splitter to split them into firewood.

Honorable mentions: Terro ant bait to control ants; products from *www.Bugspray.com* for serious ant infestations; Murray McMurray automatic chicken waterers; Greenbug all-natural pest control spray for termites; wheelbarrow for innumerable garden tasks; Northern Industrial Tools yard cart for hauling.



Lloyd built his dining room table out of recycled lumber from Douglas fir trees.

KitchenAid Professional 600 Series mixer. This machine is reliable and unbeatable for kneading dough.

AccuSharp 001 knife sharpener. This inexpensive little tool lets you swiftly and effectively sharpen knives.

Marga Mulino grain flaker. This small, hand-powered Italian roller turns oat groats into rolled oats, and can be set for finer grinds as well.

Fermenting crock. Using a ceramic vessel to ferment foods is so simple. To make sauerkraut, for example, you just shred cabbage, add salt and let the mixture sit for a few weeks. Our favorite pot, made in Poland, features a water seal.

Rheem hot water heater. I installed a 5-gallon electric hot water heater under

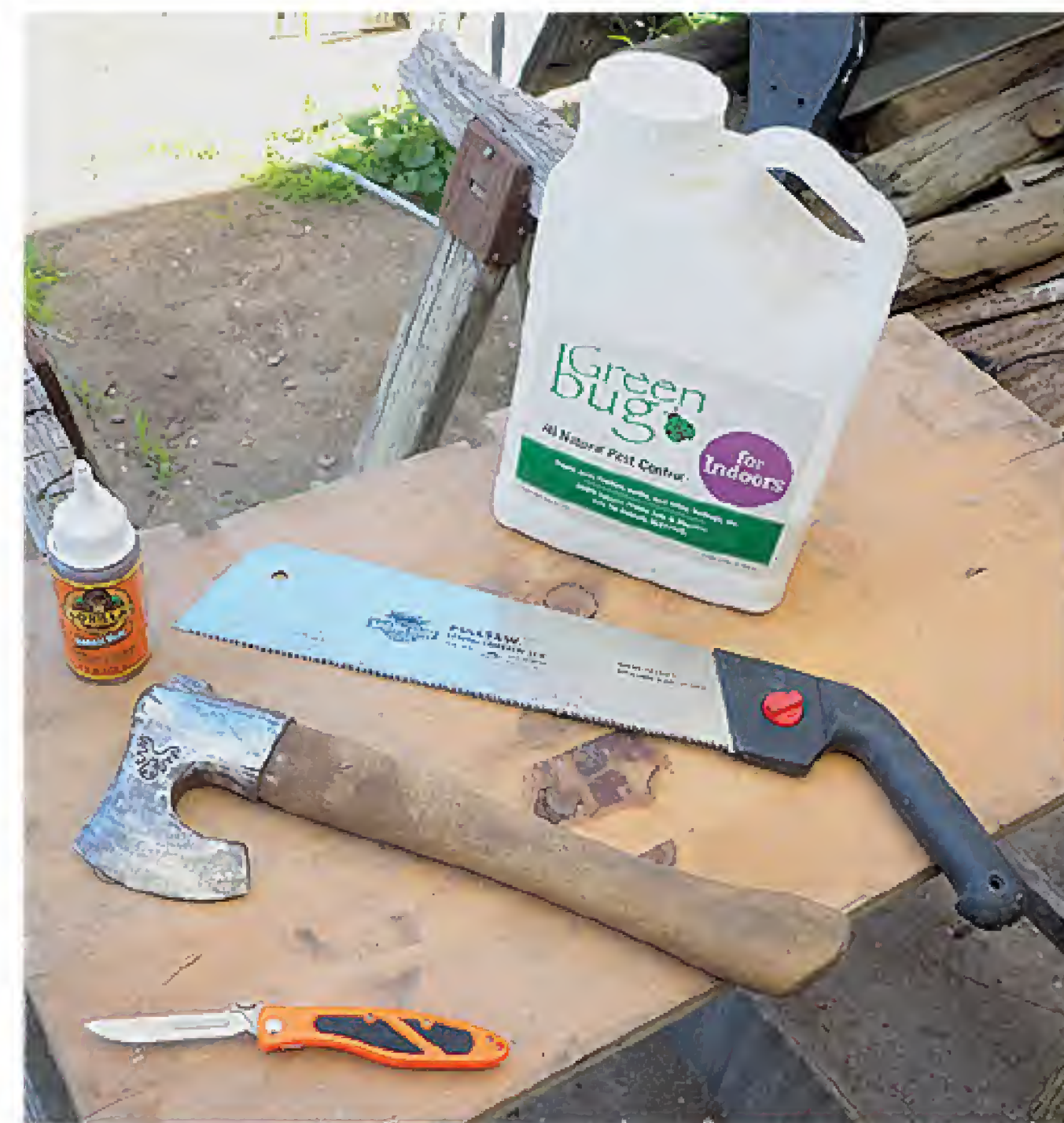
In the Kitchen

WonderMill 110-volt electric grain mill. This mill grinds grain quickly and efficiently. We use it to grind wheat and rye for our sourdough bread, make our own cream of rice, and grind oat groats into flour for pancakes and waffles.





Using cedar shakes split with a froe (left), Lloyd crafted a tool carrier (above). His shop (below) contains a multitude of instruments, including a skinning knife, a Roselli hatchet and a SharkSaw Pullsaw (right).



the kitchen sink. It uses minimal electricity and provides hot water right at the source.

Dishwashing system. In place of a dishwasher, we use Rubbermaid 4-gallon dishpans to wash dishes in, and we place the dishes in a custom-built rack for drying and storage.

Honorable mentions: Chef's Choice cordless tea kettle for coffee, tea and hot water needs; Component Design Northwest meat thermometer for an accurate temperature read when cooking meat; Pure Water water distiller for drinking water; Messermeister poultry shears for cutting up poultry; Weber Genesis liquid-propane gas grill for cooking meat, poultry and fish outdoors.

Shop Essentials

Mighty Mac 12P hammermill chipper-shredder. Ours has lasted more than 30 years. The side-feeding chipper is powerful enough to chip a 2-by-4. We use it to grind up branches and garden trimmings for the compost pile. *Never* push branches down into the hopper with your hands; use a 2-by-4 instead.

Makita variable-speed impact driver with a lithium-ion battery. This driver has been a game changer for me. It uses both rotation and concussive blows to drive screws, and it's two to three times as powerful as the familiar drill-driver. The trigger controls the speed.

Protective gear. If you operate a chainsaw, please wear protective gear, such as

the Husqvarna Pro Forest helmet and face shield system.

Saws. Lots of saws. I have a 40-year-old Delta radial arm saw that's still going strong, a vintage Delta 10-inch table saw, an old, reconditioned Makita miter saw, a Porter-Cable circular saw, a Makita 4350 FCT top handle jigsaw, and a Stihl 24-inch MS 270 chainsaw. For a handsaw, I now wield a Japanese SharkSaw Pullsaw in place of my old U.S.-made push saws. The Pullsaw is faster and more accurate.

Lehman's froe. I make wooden shakes with a froe (see photo, above left). You can make shakes if you have access to tight-grained lumber, such as redwood or cedar.



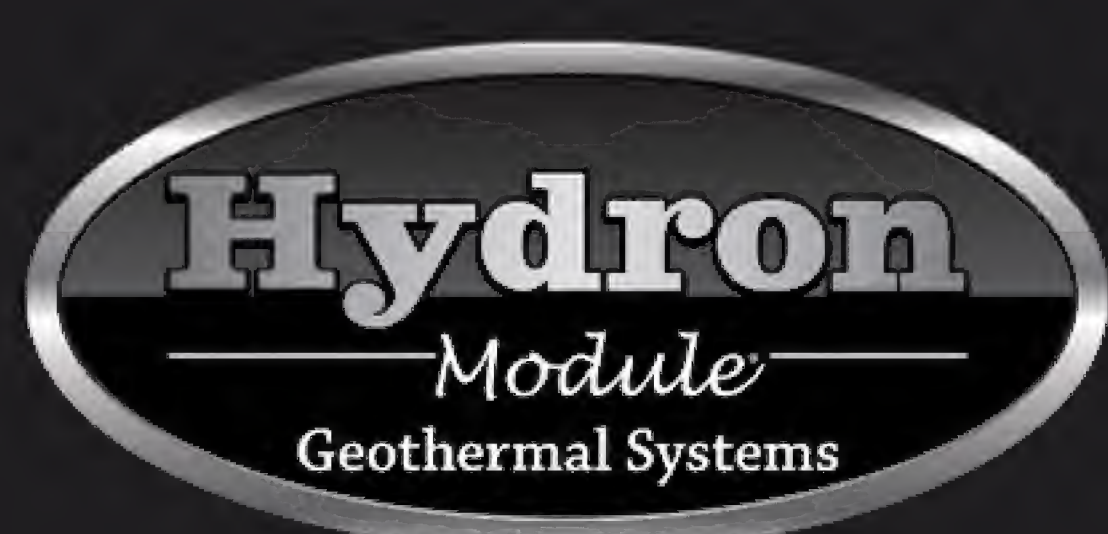
Honorable mentions: Mintcraft butcher saw for butchering deer and wild pigs; Gorilla Glue adhesive products; Honda 2,800-watt portable inverter generator to keep our appliances running in case of power outages; Norton Arkansas oilstone for sharpening knives and chisels; Roselli hatchet for woodcarving; Victorinox Swiss Army Centurion knife for garden and maintenance work; Havalon skinning knife for skinning deer and roadkill.

I hope these durable tools help you as much as they've helped me. And remember, for homesteaders of any persuasion: The easy way is hard enough. 🌲

Influential homesteader and publisher Lloyd Kahn is a well-known proponent of natural, handmade building. His most recent book is *Tiny Homes on the Move* (see Page 64 to order). Find a list of the tools mentioned here, as well as links to purchase them, at www.LloydKahn.com.



This woodstove has been the only source of heat in Lloyd and Lesley's home for more than 30 years.



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BEEKEEPING BASICS

What's All the Buzz About?

If you're interested in raising honey bees but aren't sure you can commit, here's a rundown of the equipment you'll need to get started and the schedule you can expect to follow.

By Hannah Kincaid
Illustrations by Liz Pepperell

No wonder more and more folks are making a beeline for beekeeping—a single hive of these tiny, social pollinators can provide 40 to 60 pounds of golden honey per year, as well as a few pounds of ever-useful beeswax. Plus, many crops need honey bees (*Apis mellifera*) to achieve good fruit set and high yields. This pollination benefit is becoming increasingly important because of industrial agriculture's dependency on toxic pesticides, which poison bees' food supplies and result in lower pollinator populations. For the willing homesteader or backyard gardening enthusiast, dedicating a small amount of time every couple of weeks to maintaining a beehive will render sweet returns indeed.

Like any livestock, bees need care and attention, though the time commitment can be far less than for dairy goats or even chickens. To help you decide whether beekeeping would be a good fit, we asked Kim Flottum, longtime editor of *Bee Culture* magazine, to help us outline the beekeeping essentials, including what to expect in terms of initial start-up needs and costs, along with a basic apiary to-do calendar.

Tools of the Trade

Start with a new hive body and frames. Looking for a bargain on used beekeeping equipment may be tempting, but bees are susceptible to several diseases that can persist in old equipment. Also, you may come across suggestions to foster a wild swarm that someone has captured. The concern here is that a wild swarm (particularly one found in the western or southern United States) may have crossbred with aggressive Africanized honey bees. Buy either a package or a nucleus colony (called a "nuc") of gentle bees with a queen (see "Which Bee Is for Me?" on Page 56).

You'll choose one of two hive designs. The more common Langstroth hive, named after its inventor, consists of stacked,

rectangular boxes that contain removable wooden frames with pre-formed foundations upon which the bees will build their wax comb (see illustration at the top of Page 56). The removable frames in the Langstroth system make monitoring the health of the hive easy, and its popularity means tracking down replacement parts is convenient. Expect to pay about \$250 for an unassembled cedar Langstroth hive that includes one hive body and two additional boxes called "supers" for honey storage, as well as 30 frames (10 frames per box) and a lid, cover, bottom board, and screws.

These Langstroth hives are tended by a beekeeper in a full, hooded suit. She used the smoker to suppress the bees' defensive behavior.



The simpler top-bar hive design consists of a trough-shaped, lidded box with wooden bars laid across the top of the interior (see illustration at the bottom of Page 56). The bees establish their own U-shaped combs suspended from the bars. Expect to pay about \$180 for an unassembled top-bar kit with plans, or \$50 in materials to build your own. Top-bar hives will typically produce about 20 percent less honey than a Langstroth, but the beeswax is easier to harvest. Despite yielding less honey, proponents say the top-bar design results in a gentler, happier hive that's a viable option for beekeepers more concerned with conservation and plant pollination than with maximum honey production. To dig deeper into top-bar hives, see our article "Keeping Bees: Using the Top-Bar Beekeeping Method" at <http://goo.gl/7Xp9Q3>, which also includes plans for DIY top-bar hives.

In addition to one or two initial hives, you'll need a few specialized beekeeping tools. A smoker (\$20) is used to suppress defensive behavior in bees. A hive tool (\$10) looks similar to a crowbar and is used to remove frames from the hive. A feeder (\$15) should be filled with sugar water and placed inside your hive to provide food when you first introduce the bees to their new home and during periods when nectar

is scarce. Most beekeepers start with a hooded beekeeping suit (\$70), which should include gloves. You may opt to later shed some pieces as you become more comfortable around the bees. All in all, you'll probably spend between \$200 and \$400 for your first hive and the basic beekeeping equipment (not including bees).



Which Bee Is for Me?

A typical bee package costs about \$130, plus shipping, and holds 3 pounds of loose adult bees and an individually packaged queen. Alternatively, a nuc is made up of Langstroth-fitting frames already populated with bees, including a queen, and you simply slide the frames into your hive. Nucs are slightly more expensive than packages because they contain working frames—expect to pay approximately \$150 for a nuc, which must be picked up rather than mailed.

Just as different breeds of cows or chickens are better suited to certain homesteads and purposes, some specific types of honey bees are best for home beekeepers. Flottum says every bee supplier strives to produce the calmest bees possible, but that Carniolan bees tend to be more subdued than the more readily available Italian bees. Some types of bees also have more resistance to pests and diseases. For example, Minnesota Hygienic Italians and bees with Varroa Sensitive Hygiene (VSH) traits have a high degree of resistance to Varroa mites, American foulbrood and chalkbrood.

The Apicultural Calendar

Before your bees arrive, do some homework and consider shadowing an experienced beekeeper so you're able to recognize normal hive behavior and honeycomb structure, as well as what potential invaders, such as mites, look like. Many local beekeeping associations offer workshops, and Flottum recommends finding a nearby beekeeping mentor to help you learn the ropes.

According to the Backyard Beekeepers Association, you should plan on spending about 30 hours a year maintaining your hives. Your time commitment will parallel the pollen and nectar flows—when it's peak gardening season, it's also peak beekeeping season.

If you decide to keep bees, place your package or nuc order in winter for pickup when warmer weather arrives. One fine spring day, you'll get a phone call from your post office or a local beekeeper declaring that your package or nuc of bees is waiting. Make sure your hive is assembled by this time and ready to immediately house its new residents. Carefully read directions about how to best install the bees into your hive. With a package, you'll basically pour the colony into the hive, then lodge the queen's cage between two of the



A basic Langstroth hive will include a lid, cover, two supers and one hive body—each filled with removable frames—a bottom board, and a concrete or wooden stand to elevate the hive off the ground.

frames. The queen's enclosure will have a little plug of sugar candy on the end, which will prevent her from immediately joining the hive. Over the course of a few days, the hive will settle into its new home and simultaneously chew the queen free from her chamber. If you ordered a nuc, you'll simply transfer the established frames with bees and the queen into your empty Langstroth hive. After your bees are successfully added to their hive, install the feeder.

Wait one week after you've installed your bees to do your initial inspection.

Your goal will be to make sure the queen is laying eggs. Return at least once every week or two to check the hive's overall health and monitor its growth. Becoming familiar with the life cycles and daily tasks of the bees will be key to your ability to assess their health and vitality.

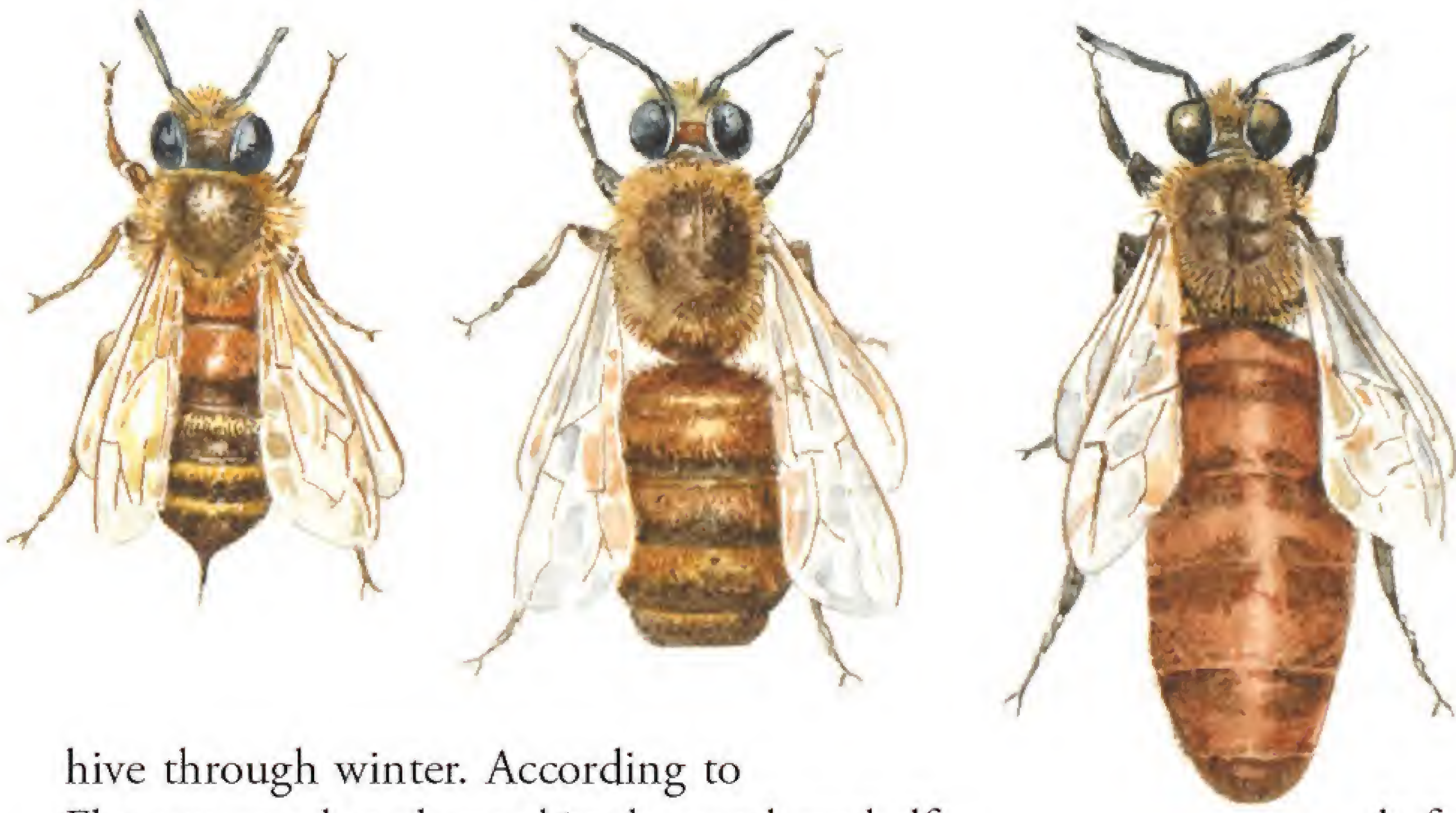
As the weather warms, visits to the beehive will be mainly to look at the amount of honey in storage and to make sure there's a thriving population of active, healthy bees. Begin preparations for colder weather by installing a windbreak and a mouse guard at the entrance. Throughout the entire season, whenever pollen or nectar levels are low, you'll need to provide protein supplements to stand in for pollen, and sugar water in place of nectar. Just as you would never let your cows go without hay or your hens go without feed, you should never let your bees go hungry.

The Sweetest Reward

Your colony probably won't produce enough honey for a harvest the first year, and your focus should remain on learning the ways of the hive. In the second year, however, and in years thereafter, the honey harvest will take place around September. When harvesting honey, you must leave enough to feed your



Top-bar hives allow bees to build their own U-shaped combs that will hang from the wooden bars laid across the hive's interior.



From left to right: Female worker bees make up the majority of a hive. Male drones' sole purpose is to mate with a queen, after which they die. Each hive has one queen, and she can lay up to 2,000 eggs per day.

hive through winter. According to Flottum, a colony located in the northern half of the United States should have at least 100 pounds of honey stored for winter; a colony in the southern half will need at least 50 pounds. Depending on the depth of your hive design and the number of frames used, your hive should weigh between 150 and 200 pounds total—including the bottom, boxes, frames, bees, brood and honey—at the beginning of winter. Use a handheld spring scale to weigh your hive, and if it weighs more than this amount, you can remove the excess honey for your use.

Honey is ripe for gathering when a frame has at least two-thirds of its cells filled with honey and capped with wax. A simple harvesting technique is “brushing.” This involves holding a ripe frame over the hive and gently brushing as many bees as possible back into the hive before placing the mostly deserted frame into a separate box. To extract the honey from the comb, just cut away the wax capping with a knife and then remove the honey from the wax comb either by manually crushing and straining the comb or by using a mechanical extractor.

Apiary management is an activity that most everyone in your family can enjoy. In addition to savoring the sweet golden elixir and useful beeswax, you'll all appreciate the increased garden harvests and marvel at the hustling hive's diligence. 🐝

RESOURCES

Find reliable suppliers of bees and beekeeping equipment:

Bee Culture magazine: www.BeeCulture.com

The Backyard Beekeeper by Kim Flottum; available on Page 64

Hannah Kincaid is an editor for MOTHER EARTH NEWS. She uses beeswax in her homemade healing salves and spreads fresh honeycomb on grilled pumpkin bread.

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Circle #55; see card pg 81

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How to Lobby for SANER FOOD POLICIES



Adopt these talking points to engage in a positive way with your elected officials.

We live in an era of sound-bite messaging. Bombarded with information, we feel pressure to make snap judgments and move on. Nowhere is this demand more apparent than in the political arena. The sheer number of words in a piece of legislation frequently precludes elected representatives from actually even reading a bill before voting on it!

Legislators need real-world information about issues in order to clearly understand how the laws they pass affect the day-to-day lives of citizens. Instead, much of their “education” comes from paid lobbyists. Homesteaders and ad-

vocates for a sustainable food system generally don’t have the resources to buy such access, so it’s up to us to lobby for ourselves. But most of us have no training in how to lobby and don’t know where to begin in developing our own political talking points.

My first experience with this conundrum occurred several years ago, when a member of the Virginia House of Delegates asked me to accompany him on a lobbying effort in the state’s general assembly building. The two of us spent the day visiting offices in an attempt to discuss with legislators a bill to exempt direct farmer-to-consumer food sales from government licensing.

Each time we could actually get 10 to 15 minutes with a senator or delegate, we got good vibes. But when a legislator was too busy to see us for more than a minute, we couldn’t make any headway. Plus, we couldn’t even begin to get around to all 100-plus legislators. At the end of the day, I commented to my host that if we could’ve had half an hour with each legislator, our bill would pass.

Shaking his head, the delegate gave me a piece of wisdom I’ve never forgotten: “That’s not how the system works,” he said. He went on to tell me that the system’s current design actually prohibits meaningful conversation. The often hectic pace and frenetic number of hearings require that politicians make up their minds in an instant. “This process doesn’t encourage thoughtful contemplation—that takes

NORM SHAFER, TOP: TERESA SALATIN



Author Joel Salatin deploys his talking points at a public hearing in Augusta County, Va., to support a measure allowing backyard chickens.

too much time. Usually, you have to figure out as quickly as possible which side you're on so you can move on to the next bill," he said.

That's not great news for a deliberative process, but there you have it. It is tremendously important that we engage in the political process, however. No matter how frustrated you may be with the system, I'm confident that if you keep at it, you'll manage to wrangle a few minutes of conversation with a policymaker.

Focus Your Message

It's important that you go into any meeting as prepared as you can manage and then do your best to stay on topic. To help you prepare, here are the talking points I'd use if I could have 10 minutes with any elected official to discuss a particular policy or piece of legislation. Please use or adapt as you see fit.

1 Nature is more powerful than humans. The rules of nature trump



Farmers listen intently as Missouri Gov. Jay Nixon speaks about drought and farm policy at a town hall meeting in Ewing, Mo. Political involvement is important, especially when we disagree.

Wall Street, the White House, every elected official, and even the Pentagon. Try as they might, all the posturing of legislators and all the military muscle in the world can't build soil out of chemical fertilizer. Nature runs on carbon; it always has and it always will. The immutable laws of nature require that solar power be converted through

photosynthesis into food for the creatures in the soil — and for us.

We're not divine; we're dependent. We should practice more humility and less hubris. We should do what supports our planet's vital natural systems and enact laws that align with those processes. Nature respects no political party, no lobbyist, and fears no media

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Circle #15; see card pg 81

headlines. Nature doesn't run on petroleum and synthetic chemicals. Every healthy ecosystem in the world is full of animals. They don't live in factories and they don't do drugs. Nature demands multi-speciation, integration, diversity, complexity and symbiosis. We need to support those demands.

Given our dependence on soil, every policy should start with a simple benchmark: "Does this policy help or hinder the building of healthy soil?" No civilization can be successful if it disregards nature's most basic rules.

2 Don't only ask the experts. Politicians rely on experts, but these experts are frequently paid by the industries they're being asked to comment on (or at the very least are steeped in the orthodoxy of the day). I remember testifying a few years ago before the Virginia senate agriculture committee and the state's Commissioner of Agriculture. A group of fellow farmers, local food advocates and I had put

Nature respects no political party, no lobbyist, and fears no media headlines.

forward a bill to allow the sale of raw milk to consumers. The commissioner, who grew up on a dairy farm, said he drank raw milk religiously until he went to college, where he learned how dangerous it was. So he quit drinking it.

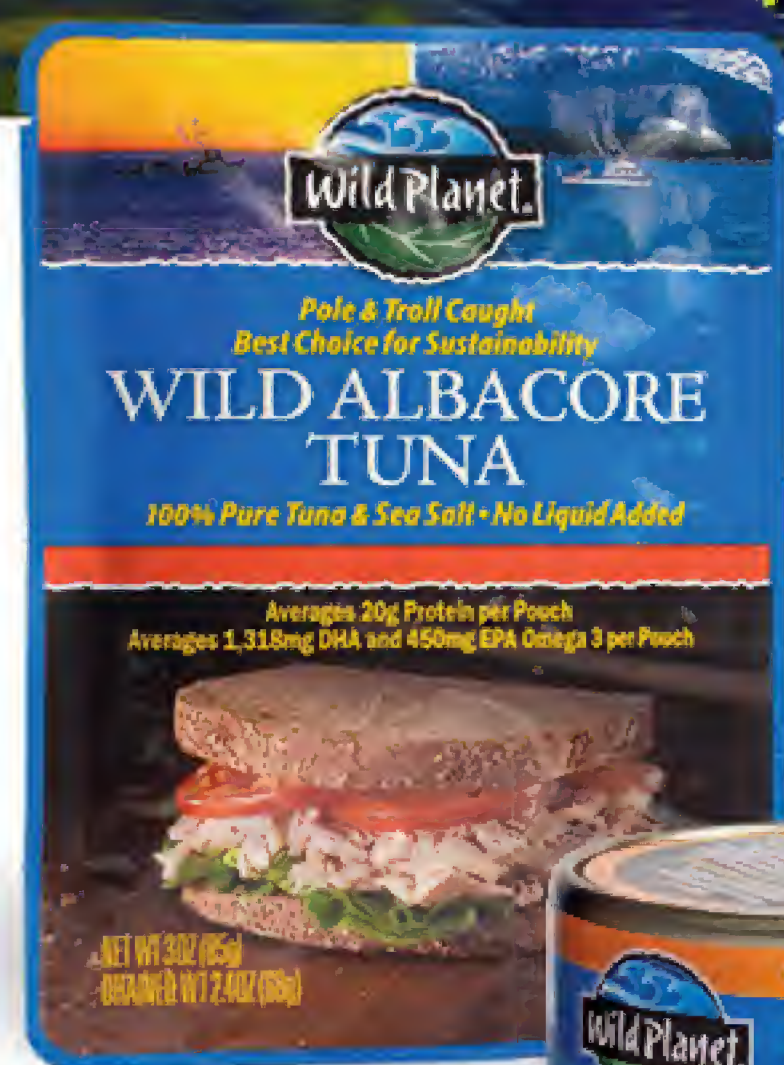
Now, he advised the senators, not only should you not drink it, but you should make it illegal for anyone else to drink it. He was oversimplifying, of course. (On another occasion, his undersecretary said consumers were too ignorant to choose which foods to eat.)

Readers of MOTHER EARTH NEWS, I contend, are far more knowledgeable about safe foods than are many bureaucrats. We didn't buy into the hydrogenated oil recommendations of the "experts." Most of us didn't

believe the margarine myth. After we realized the facts, we didn't regard Wonder Bread as the correct nutritional base for our government-sanctioned food pyramid. We haven't abandoned our kitchens for TV dinners and processed food-like substances. In many cases, folks who had been eating in that manner found their way to much healthier food choices here in MOTHER's trusty pages.

So ask your legislators these questions: "On this policy, have you sought counsel from nonexperts, those 'in the trenches,' and without financial ties to industry? Have you tried a process of discovery from the ground up, rather than the top down?"

3 Freedom and innovation require protecting the lunatic fringe. We know that innovation comes from those who dare to question the orthodoxy of the status quo. Strong societies embrace wackos, knowing that the fringe doesn't jeopardize overall



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Circle #32; see card pg 81

How to Look Up Your Legislator

Nonpartisan www.VoteSmart.org is a great website to help you find who represents you, from city council to U.S. senator. You can look up their positions and funding sources (when available) as well as their contact information. You can also call your local library to ask how to contact the official you want to reach.

stability. And that's just what we food-growing, pastured-animal-raising folks are in today's society: the fringe. Our culture is prone to tyrannizing the innovative outliers with regulations, bureaucracy and licensing that limits the participation of small businesses and small-scale farmers.

Is our society so weak as to fear the few heretics who dare to undertake such "radical" actions as drinking raw milk or dining on compost-grown tomatoes? Farmstead self-reliance blesses society with the tinkerers and oddballs who likely will generate many of tomorrow's breakthroughs.

This inventive fringe must be free to build houses out of straw, live off the grid, dwell in tipis, experiment with herbal remedies, and engage in other behaviors not sanctioned by mainstream society—including home schooling, home butchery and home craft—without having to meet excessive demands for licenses or overly complicated zoning regulations.

The questions to ask of any policy-maker are, "Does this legislation protect and make room for people who aren't mainstream? Does it allow for experimentation and innovation? Does it allow citizens latitude in the way they choose to live, as long as they aren't harming others?"

④ Modern economic health calculations are preposterous. Our technologically sophisticated culture measures economic health based on gross domestic product (GDP). This can mean that if society has more criminals and

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Circle #33; see card pg 81

we build more jails, GDP will go up. If we have more drug addicts and need more rehab centers, that will be considered positive economic activity. The idea that all of our ills, and the costs associated with mitigating those ills, go on our balance sheets as positive economic activity is absolutely absurd.

But beyond that, we don't subtract externalized costs. Soil erosion, polluted water and nutrient-deficient food never show up on the negative side of our country's balance sheet. Collateral damage, such as polluted waterways and dying pollinators, Type 2 diabetes and cancer, aren't negative economic figures. In fact, they're viewed as positive because of the economic activity their remediation instigates.

Folks, could this situation be any more absurd?

We need to engage with our elected leaders and we need to demand some answers to these essential questions: "What does such a system do to the common good? Does a proposed policy add to or detract from the commons? Does it actually heal or hurt?" Ultimately, if a policy is not supportive of life, it's not acceptable.

There you have it. Of course, I'd like to say a lot more. Goodness, I'm just getting warmed up. But I hope my sound-bite explanation of how I represent my vision to politicians will help you develop your own political talking points, so you feel confident lobbying for Earth stewardship and a more sustainable food system.

Then, get involved. Creating a strong, resilient food system is well worth the trouble. 🌱

Joel Salatin raises chickens on his family farm in Virginia and raises Cain wherever he thinks he can influence policy in the direction of better soil and food production on our planet. His most recent books are *Fields of Farmers: Interning, Mentoring, Partnering, Germinating*; and *Folks, This Ain't Normal* (see Page 64 to order).

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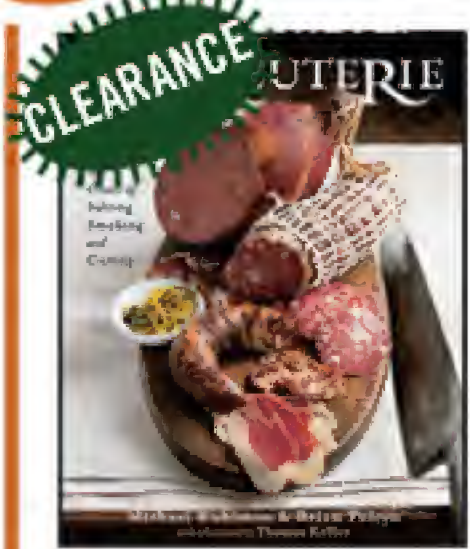
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Circle #46; see card pg 81



real food



CHARCUTERIE

Charcuterie is a culinary specialty that originally referred to the creation and preservation of pork products, such as salami, sausages and prosciutto. This book presents 125 recipes that are both intriguing to professionals and accessible to home cooks, including salted, air-dried ham; Maryland crab, scallop and saffron terrine; mortadella and soppressata; and even spicy smoked almonds.

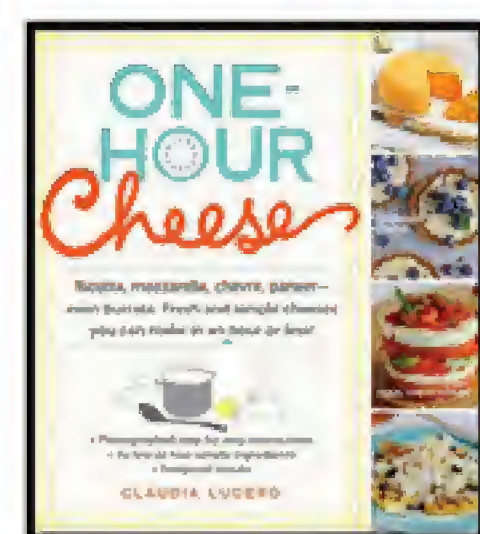
#6403 ~~\$35.00~~ \$19.25



BALL COMPLETE BOOK OF HOME PRESERVING

The experts at Ball Home Canning Products' book has become the bible of home preserving. These 400 innovative and enticing recipes describe how to make and preserve everything from salsas and savory sauces to jams, jellies and fruit spreads. This book includes comprehensive directions on safe canning and preserving methods, plus lists of required equipment and utensils.

#5473 \$22.95



ONE-HOUR CHEESE

It's a DIY cook's dream come true: It's pizza night, and you've made not only the crust and sauce, but the mozzarella, too. Or, you're whipping up quesadillas for a snack, using your homemade Triple Pepper Hack. *One-Hour Cheese* includes

16 recipes for fresh cheeses that can be made in an hour or less, using readily available ingredients and tools. And, they'll be just as delicious as store-bought!

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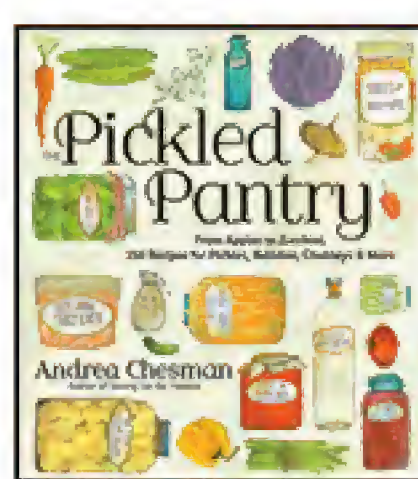


INDEPENDENCE DAYS

This book is packed with valuable secrets to home food preservation, including information on canning and dehydrating techniques, root cellaring, season extension, and a host of broader topics. In addition, it focuses on how to enjoy a delicious, high-quality diet at home year-round, how to preserve food on a community scale, and how to reduce reliance on industrial agriculture

by creating self-sufficient and vibrant local economies.

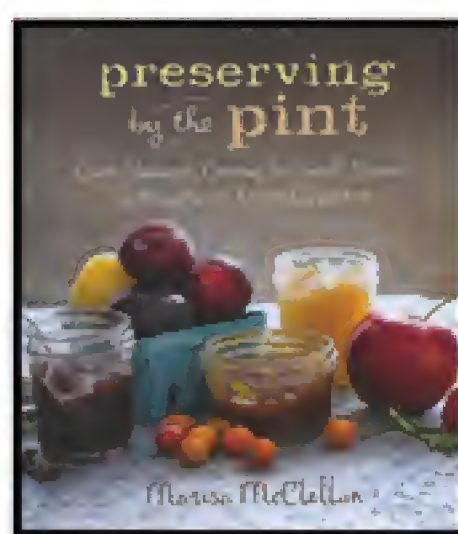
#4299 ~~\$19.95~~ \$9.08



THE PICKLED PANTRY

With Andrea Chesman's expert guidance, you'll love making dozens of fresh, contemporary recipes for pickling everything from apples to zucchini. Beginners will welcome the simple, low-fuss methods and thorough coverage of the basics, and dedicated home canners will love the large-batch recipes and stunning variety of flavors.

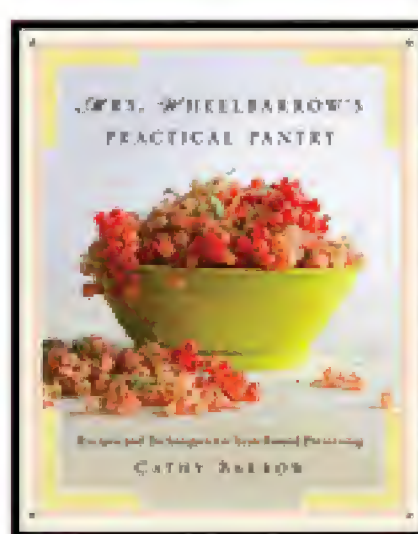
#5946 \$19.95



PRESERVING BY THE PINT

Preserving by the Pint is meant to be a guide for putting up smaller batches of foods from farmers markets and produce stands, bringing together preserving tricks for stopping time in a jar. Author Marisa McClellan found that smaller batches suited her life best: Working with a quart, pound, pint or bunch of produce (and not a bushel) allows for dabbling in preserving without committing a whole shelf to storing a single type of jam.

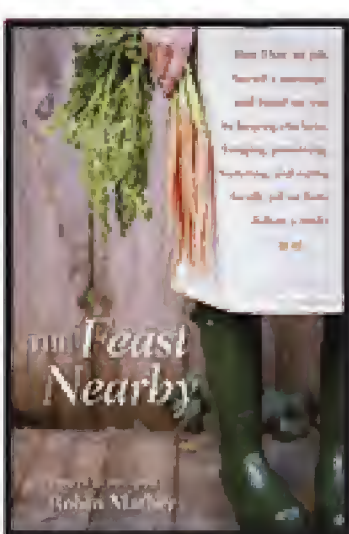
#7145 \$23.00



MRS. WHEELBARROW'S PRACTICAL PANTRY

Author Cathy Barrow presents a beautiful collection of essential preserving techniques for turning the fleeting abundance of the farmers market into a well-stocked pantry full of canned fruits and vegetables, jams, stocks, soups, and more. In addition to canning techniques, this book includes 36 bonus recipes for using what you've preserved.

#7478 \$35.00



THE FEAST NEARBY

Within a single week in 2009, food journalist Robin Mather found herself on the threshold of a divorce and laid off from her job at the *Chicago Tribune*. Forced into a radical life change, she returned to her native rural Michigan. There, she learned to live on a limited budget while remaining true to her culinary principles of eating well and as locally as possible. Mather's poignant, reflective narrative shares encouraging advice for aspiring locavores everywhere, and combines the virtues of kitchen thrift with the pleasures of cooking—and eating—well.

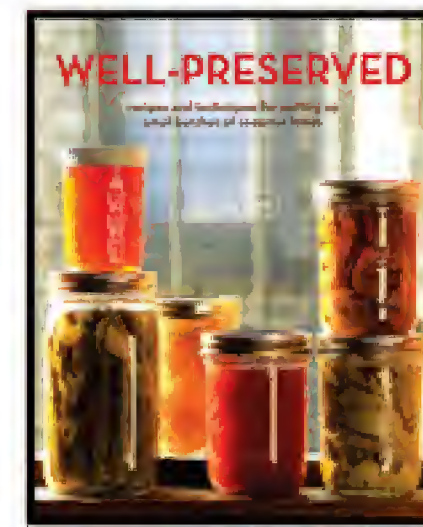
#5451 \$24.00



MEALS IN A JAR

Meals in a Jar provides step-by-step, detailed instructions for creating all-natural breakfast, lunch and dinner options that you can keep on a shelf and prepare in minutes. These scrumptious recipes allow even the most inexperienced chefs to serve delicious dishes. Not only are these meals perfect for after-school study sessions and rushed evenings, they also make for tasty fare on family camping trips and can be lifesavers in times of disaster.

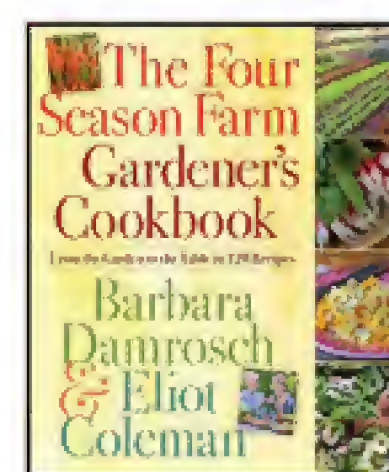
#6657 \$15.95



WELL-PRESERVED

This is a collection of 30 small-batch preserving recipes and 90 ways in which to use the preserved goods. Author Eugenia Bone covers traditional water bath and pressure canning in detail, but she also shares simpler methods that allow you to preserve foods using low-tech options, such as oil-preserving, curing and freezing. She clearly explains each technique so that you can rest assured your food is stable and safe.

#4517 \$24.95



THE FOUR SEASON FARM GARDENER'S COOKBOOK

The Four Season Farm Gardener's Cookbook is two books in one. It's a year-round, seasonal cookbook with 120 recipes to maximize the fruits (and vegetables!) of your gardening labor. It's also a step-by-step garden guide full of easy-to-follow instructions and plans for different gardens. It covers properly sizing a garden, nourishing the soil, and the importance of rotating crops and planning ahead.

#6545 \$22.95



PRESERVING EVERYTHING

How many ways can you preserve a strawberry? You can freeze it, dry it, pickle it or can it. Milk can be cultured or fermented, and then preserved as cheese or yogurt. Fish can be smoked, salted, dehydrated and preserved in oil. There is no end to the magic of food preservation, and in *Preserving Everything*, Leda Meredith leads readers through every preservation technique imaginable.

#7600 \$19.95



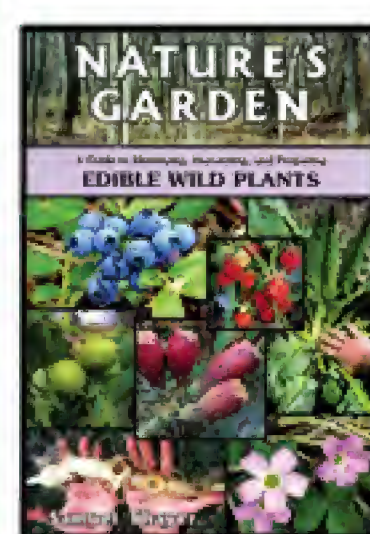
organic gardening



THE GARDEN PRIMER (2ND EDITION)

The most comprehensive and entertaining single-volume gardening reference ever printed now focuses on 100 percent organic methods. This updated version of Barbara Damrosch's classic guide rejuvenates the original material while maintaining its primary appeal: practical, creative ideas and the friendly style of an "old-fashioned dirt farmer."

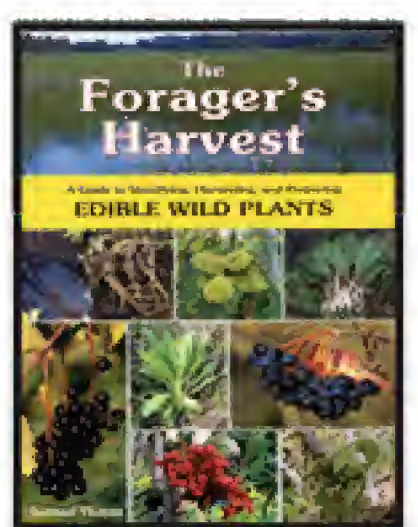
#3896 \$18.95



NATURE'S GARDEN: EDIBLE WILD PLANTS

Nature's Garden follows the same format of Samuel Thayer's first book, covering 41 wild edibles. You'll find mouthwatering photos of cranberries, blueberries, huckleberries, strawberries, wild plums and more. You'll read about vegetables with a rich tradition of use around the world that are largely ignored in wild-food literature, such as cow parsnip, patience dock and honeysuckle.

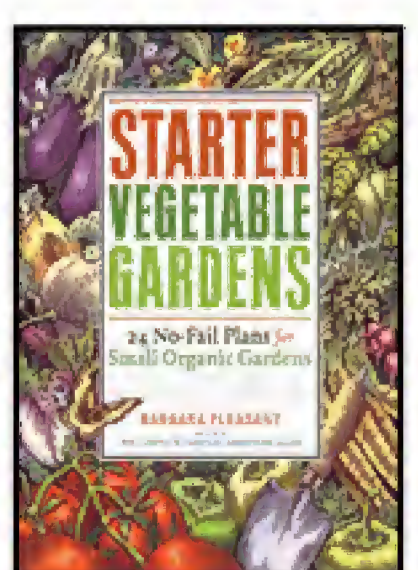
#4534 \$24.95



THE FORAGER'S HARVEST: EDIBLE WILD PLANTS

Rather than cover hundreds of plants in abbreviated accounts like the typical field guide, author Samuel Thayer has chosen a smaller selection of species to discuss in exhaustive detail. This book contains as many as 10 high-quality photos of each plant and the accompanying text is accurate and thorough, giving readers of any experience level the confidence to harvest wild plants for food.

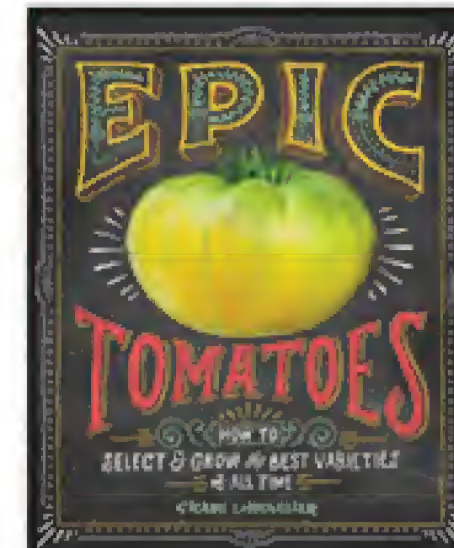
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STARTER VEGETABLE GARDENS

Master gardener Barbara Pleasant takes the guesswork and anxiety out of growing food, explaining in simple language exactly how to start, maintain and eventually expand an organic vegetable garden, even in the smallest of spaces. Choose one of 24 no-fail, small-scale garden plans and find out how easy it is to enjoy your own fresh food all season long.

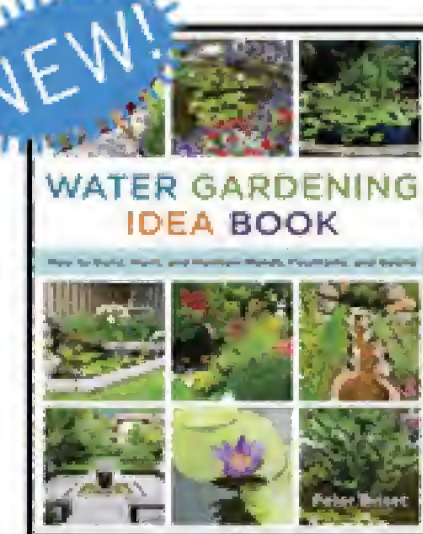
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EPIC TOMATOES

Craig LeHoullier, tomato adviser for Seed Savers Exchange, offers everything a tomato enthusiast needs to know about growing more than 200 varieties of tomatoes—from sowing seeds and planting to cultivating and collecting seeds at the end of the season. He also offers a comprehensive guide to the various pests and diseases of tomatoes and explains how best to avoid them.

#7504 \$19.95

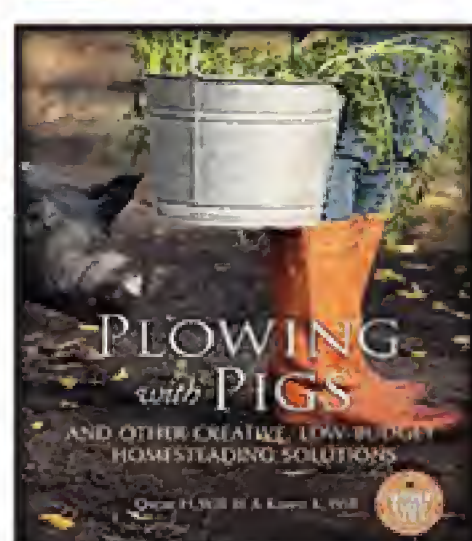


WATER GARDENING IDEA BOOK

The *Water Gardening Idea Book* gives in full detail all the practical information necessary for the selection, grouping, and successful cultivation of aquatic and other plants required to establish a water garden and its surroundings. It's perfect for both amateurs and those with green thumbs looking to take their gardens to the next level. Whether you're interested in creating a casual pond or a formal foundation, with this book, you'll be able to create them with confidence.

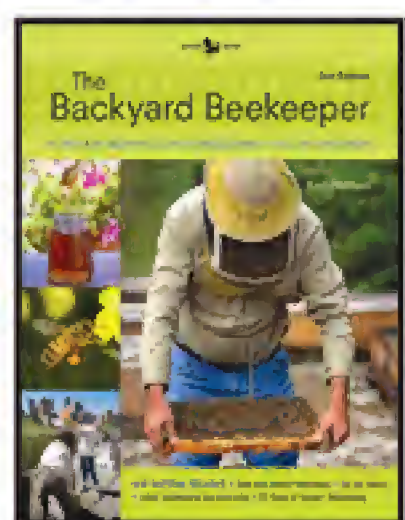
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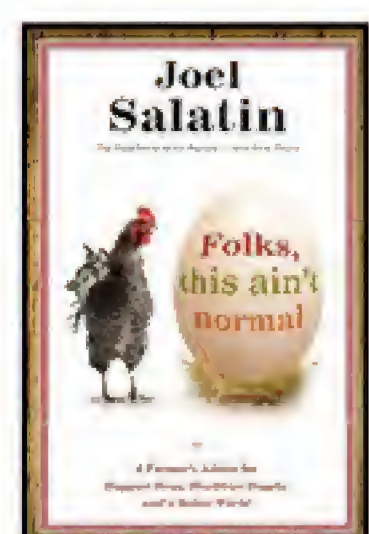
PLOWING WITH PIGS

This highly readable and entertaining guide brings together answers to common problems faced by homesteaders young, old, urban, suburban and rural. This book offers them a set of fresh ideas for achieving independence through sweat equity and the use of unconventional resources. Ideas include animal management strategies, pole building and construction techniques, replacing farm machinery with homemade hand tools, and leveraging increased self-sufficiency into a home-based business. **#6534 \$24.95**



THE BACKYARD BEEKEEPER

This expanded edition gives you even more information on "greening" your beekeeping with sustainable practices, pesticide-resistant bees, and urban and suburban beekeeping. This complete honey bee resource contains general information on bees; a how-to guide on setting up, caring for, and harvesting honey from your own colonies; and tons of bee-related facts and projects. **#2422 \$24.99**



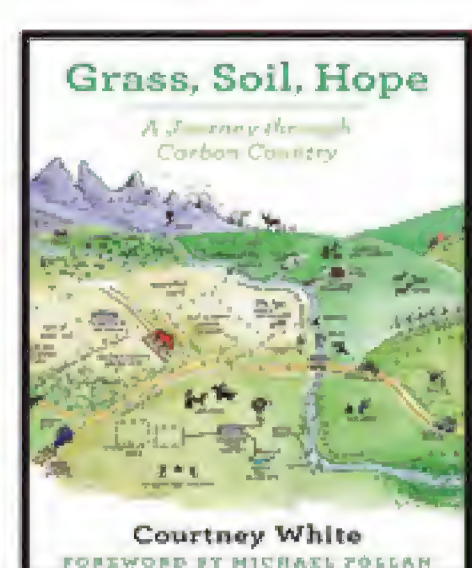
FOLKS, THIS AIN'T NORMAL

In *Folks, This Ain't Normal*, Joel Salatin discusses how far removed we are from the simple, sustainable joy that comes from living close to the land and the people we love. Salatin has many thoughts on what "normal" is, and shares practical and philosophical ideas for changing our lives in small ways that have a big impact. **#5743 \$25.99**



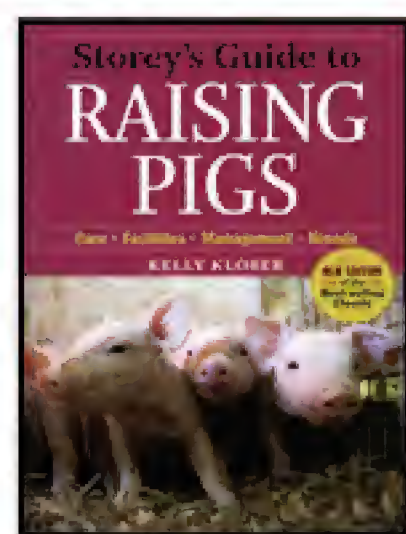
THE BACKYARD HOMESTEAD BOOK OF BUILDING PROJECTS

Expert woodworker Spike Carlsen offers clear, simple, fully illustrated instructions for a variety of projects, including plant supports, a clothesline, a potting bench, a chicken coop, a hoop greenhouse, a cold frame, a beehive, a root cellar with storage bins, and an outdoor shower. Most of the projects are suitable for complete novices, and all require just basic tools and standard building materials. *Discount available until July 31, 2015.* **#7193 ~~\$24.95~~ \$18.71**



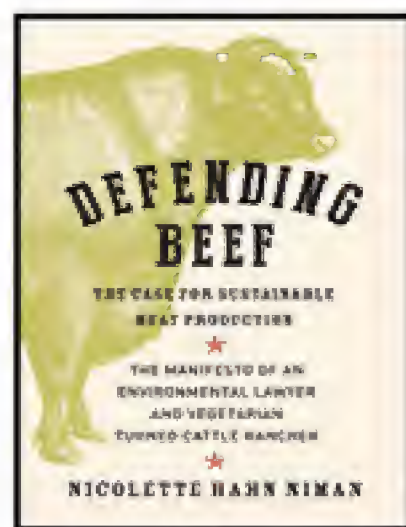
GRASS, SOIL, HOPE

This book tackles an increasingly crucial question: What can we do about the seemingly intractable challenges confronting all of humanity today, including climate change, global hunger, water scarcity, environmental stress and economic instability? Courtney White explains how practical strategies can be bundled together into an economic and ecological whole, with the aim of reducing atmospheric carbon dioxide while producing substantial co-benefits for all living things. **#7054 \$19.95**



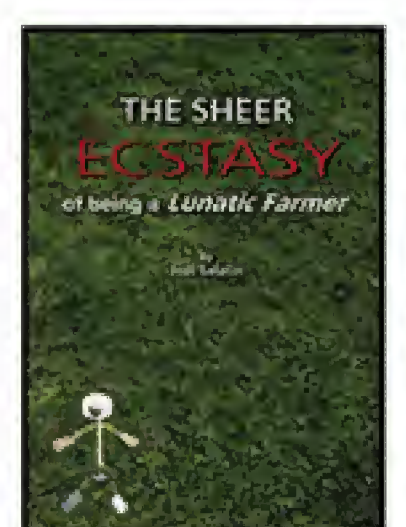
STOREY'S GUIDE TO RAISING PIGS

This trusted resource for new and experienced pig farmers provides authoritative advice on breed selection, housing, humane handling and butchering, disease prevention and treatment, and more. This newly updated third edition includes thorough coverage of green farming methods and an expanded breed guide, including information on rare heritage breeds. **#4649 \$19.95**



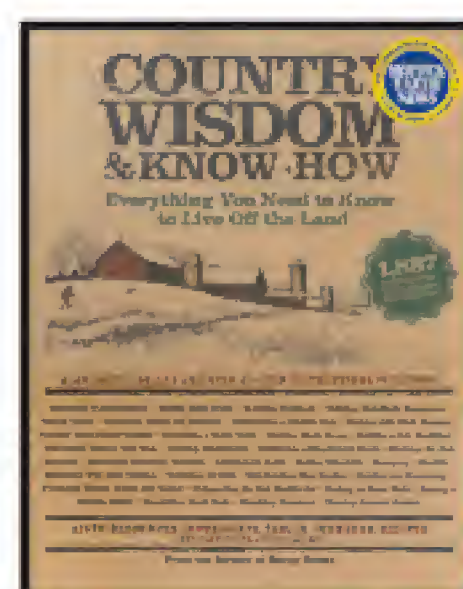
DEFENDING BEEF

In *Defending Beef*, Nicolette Hahn Niman argues that cattle are not inherently bad for either the Earth nor our own nutritional health. Niman argues that dispersed grass-fed, small-scale farms can and should become the basis for American food production, replacing the factory farms that harm animals and the environment. *Defending Beef* is simultaneously a book about big ideas and the author's own personal tale—she starts out as a skeptical vegetarian and eventually becomes an enthusiastic participant in environmentally sustainable ranching. **#7462 \$19.95**



THE SHEER ECSTASY OF BEING A LUNATIC FARMER

Shunned by industrial farmers, vilified by corporate agribusiness, and stalked by food police as being a lunatic, farmer-entrepreneur Joel Salatin enjoys the sheer ecstasy of being surrounded by happy, frolicking animals, dancing earthworms, and appreciative customers. This book describes the breadth and depth of the paradigm differences between healing and exploitative food systems. **#4808 \$25.00**



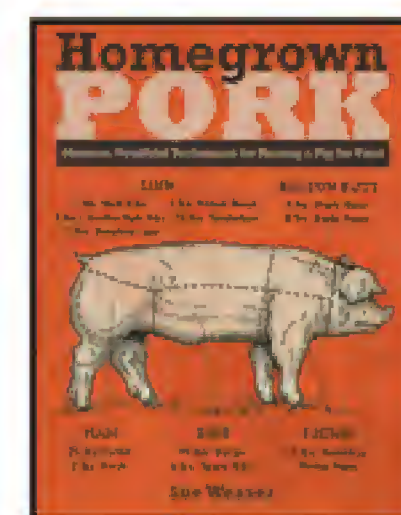
COUNTRY WISDOM & KNOW-HOW

This 476-page book is a compendium of small booklets published as "Country Wisdom Bulletins" in the 1970s. Whether you want to build a stone fence, make strawberry-rhubarb jam or plant an herb garden, this book will explain how to make your homesteading dreams a reality. **#2793 \$19.95**



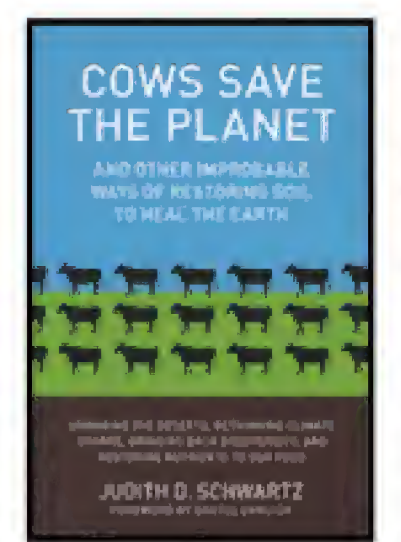
BUTCHERING POULTRY, RABBIT, LAMB, GOAT AND PORK

Using detailed, step-by-step photography to show every stage of the process, author Adam Danforth demonstrates exactly how to humanely slaughter and butcher chickens and other poultry, rabbits, sheep, pigs and goats. From creating the right pre-slaughter conditions to killing, skinning, keeping the meat cold, breaking the meat down, and creating cuts of meat you'll recognize from the market, Danforth walks you through every step, leaving nothing to chance. **#7110 \$24.95**



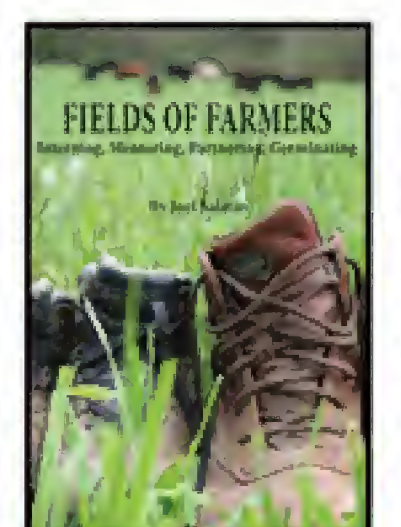
HOMEGROWN PORK

Raising a pig is easy to do, even in a small space like a suburban backyard. In just five months, a 30-pound piglet will become a 250-pound hog and provide you with 100 pounds of pork, including tenderloin, ham, ribs, bacon, sausage and more. For anyone who wants to raise a pig for meat in a backyard or on a small farm, *Homegrown Pork* explains exactly how to do it, humanely and safely. **#6947 \$18.95**



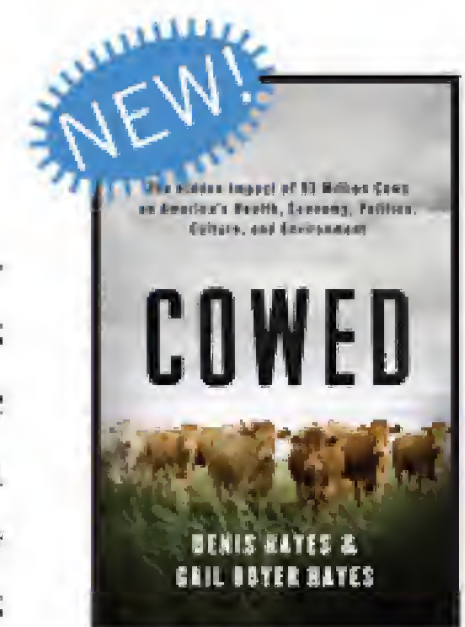
COWS SAVE THE PLANET

Journalist Judith Schwartz looks at soil as a crucible for our many overlapping environmental, economic and social crises. Schwartz reveals that for many of these problems—climate change, desertification, biodiversity loss, droughts, floods, wildfires, rural poverty, malnutrition and obesity—our ability to turn these crises into opportunities depends on how we treat the soil. **#6752 \$17.95**



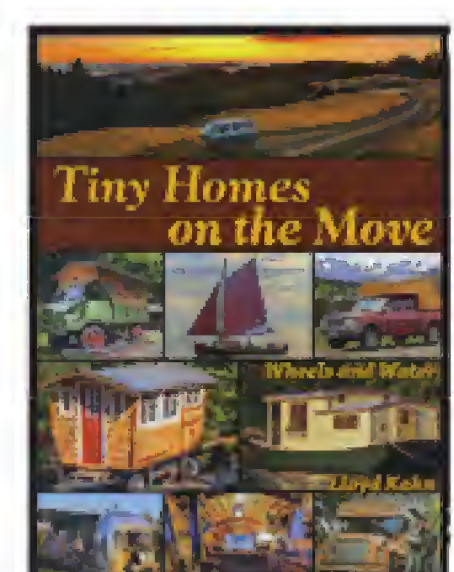
FIELDS OF FARMERS

The average U.S. farmer is 60 years old, largely because young people can't get into the business, which means old people can't get out. Based on his decades of experience at Polyface Farm, Joel Salatin digs deep into the problems and solutions surrounding this land- and knowledge-transfer crisis. *Fields of Farmers* empowers aspiring young farmers, midlife farmers and non-farming landlords to build regenerative, profitable agricultural enterprises. **#6831 \$25.00**



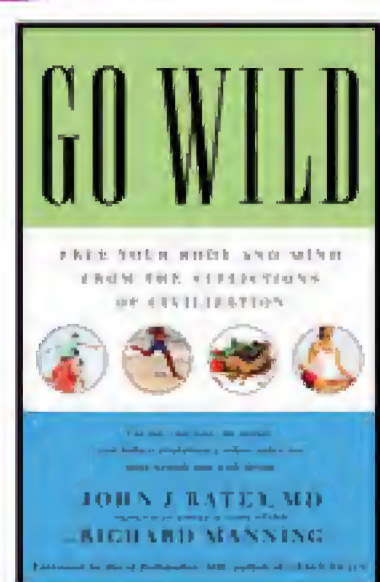
COWED

The authors show how cattle farming today has depleted the largest U.S. aquifer, created festering lagoons of animal waste, and drastically increased methane production. In a deeply researched, engagingly personal narrative, the authors provide a glimpse into what we can do now to provide a better future for cows, humans and the world we inhabit. **#7599 \$27.95**



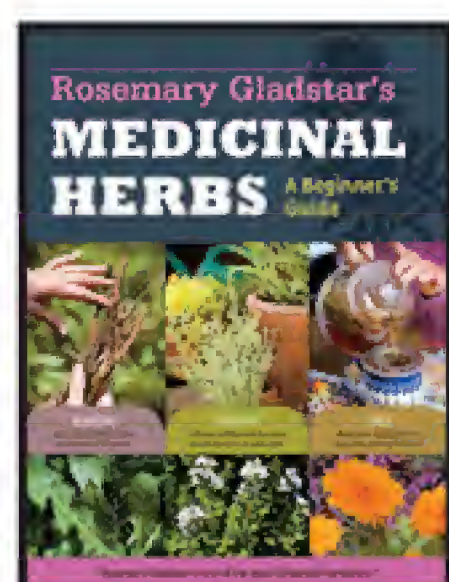
TINY HOMES ON THE MOVE

In photos and stories, this fascinating book explores modern travelers who live in vans, pickup trucks, buses, trailers, sailboats and houseboats that combine the comforts of home with the convenience of being able to pick up and go at any time. With more than 1,000 color photos accompanying the stories and descriptions of these movable sanctuaries, this is a valuable and inspirational book for anyone thinking outside the box about shelter. **#7321 \$28.95**



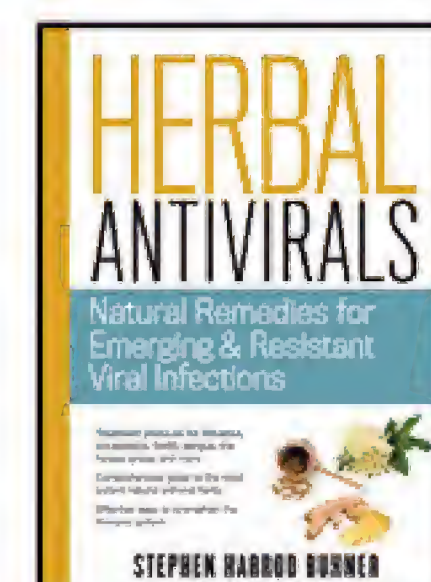
GO WILD

Harvard Medical School Professor John Ratey, M.D., and journalist Richard Manning investigate the power of living with awareness of our genetic makeup when making choices in the areas of diet, exercise, sleep and more. *Go Wild* examines how understanding our core DNA will help us combat modern disease and psychological afflictions, from depression to diabetes. **#7449 \$27.00**



ROSEMARY GLADSTAR'S MEDICINAL HERBS: A BEGINNER'S GUIDE

With Rosemary Gladstar's expert advice, anyone can make their own herbal remedies for common ailments, such as aloe lotion for poison ivy rashes, dandelion-burdock tincture for sluggish digestion, and lavender-lemon balm tea for stress relief. Gladstar profiles 33 of the most common and versatile healing plants and then shows you exactly how to grow, harvest, prepare and use them. **#5948 \$14.95**



HERBAL ANTIVIRALS

Emerging viruses are becoming more virile and aggressive, and traditional medications are becoming less effective against them. Author Stephen Harrod Buhner offers in-depth instructions on how to prepare and use herbal formulations to strengthen the immune system and treat viral infections, such as MRSA, influenza and encephalitis. **#6864 \$24.95**

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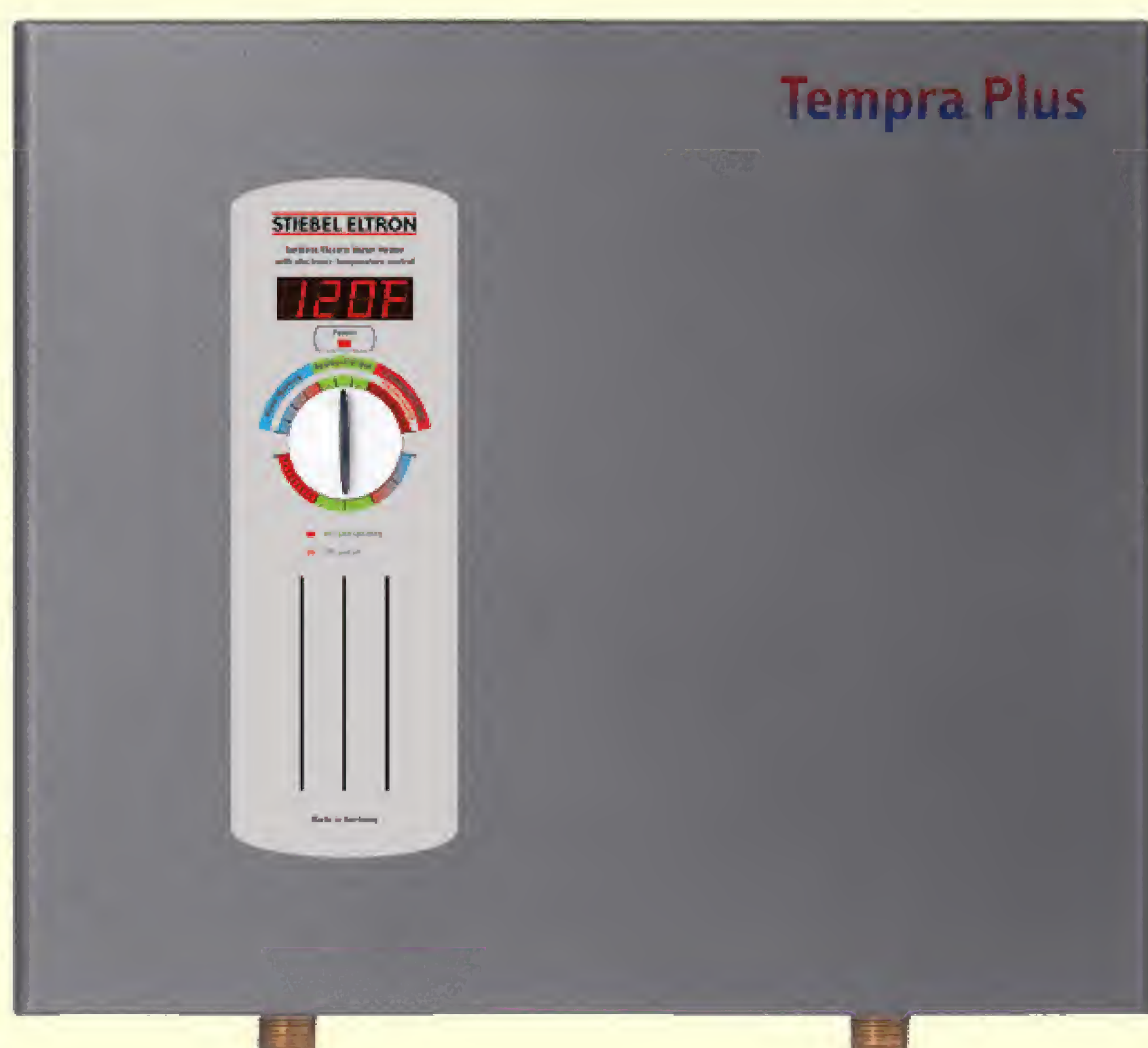


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Go Batty for Natural Mosquito Control



Place bat houses 15 to 20 feet off the ground, and in a location that bats can easily access.

After spending time outdoors at our new home, we realized we were sharing our property and summer months with swarms of mosquitoes. We wanted to eat outside, play in the woods and start a garden, but the mosquito population was really something we had to battle. We researched suggestions for controlling mosquito populations, and found many options, as well as some interesting statistics about a method that seemed natural, simple and time-tested—bats! After reviewing a few plans, we constructed a homemade bat house to attract these winged mosquito-eaters to our property. My husband is certainly no stranger to a wood shop, and he already had most of the required materials on hand.

We nestled the bat house just under the eaves of our home and waited for its pest-controlling inhabitants to arrive. We chose a location that would allow us to see the bat house, but would still give these flying mammals their privacy. Looking back, we should have chosen a free-standing bat house (like the one in the photo at left) farther from the house to discourage the bats

from finding small entries into the attic, and to prevent their droppings from dirtying our house's siding.

Summer turned to fall and the mosquitoes naturally disappeared as cold weather set in. Winter passed and spring emerged, showing signs of green, pink, yellow ... and black. That's right—black bat droppings appeared directly under the bat house. We definitely had some new residents. One evening, as dusk approached, my husband and I sat on the back porch, swatting away a few mosquitoes and keeping our eyes fixed on the entrance of the bat house. Sure enough, one by one, the bats dropped out and flew away. How exciting! We wished them a happy flight and encouraged them to do some productive mosquito control.

*Karin Johnson
Apex, North Carolina*

To learn more about these fascinating creatures and view various housing options, check out Bat Conservation International, a nonprofit organization working to protect bat species, at www.BatCon.org. —MOTHER

Keep Your Onion Sets Behind Bars

Here in the rural Southeast, I sometimes have a problem with mice nibbling on my garlic and onion sets before I plant them in fall. I had a few cricket cages left over from my fishing expeditions, so I put the garlic and onion sets inside the cages to protect them from the mice. It worked like a charm!

*Thomas Ledbetter
New London, North Carolina*

Creative Cucumber Trellis

While growing our small city garden, we've struggled with controlling cucumber vines. Then, my wife saw an arbor-like cucumber trellis she wanted me to make. The idea was to make it tall and sturdy so the vines could grow over it, and so we could walk underneath it to pick the hanging cukes.

When I got around to making our trellis, I searched through my garage for available materials. As I looked around, I noticed the

curvature of the garage door track. I just happened to have two tracks from old garage doors. If you don't have these, I think you can get them from someone who installs garage doors or from a salvage yard.

By bolting the tracks together, I constructed a sturdy frame. I then draped a leftover piece of chain-link fencing over the top and wired it to the frame. Our homemade cucumber trellis works just as we'd hoped—and I made it entirely from reclaimed materials.

*David S. Nennig
Green Bay, Wisconsin*

Get Some Extra Bang from Your Chow Bags

After emptying your cat, dog or livestock food bags, you can reuse the empty sacks for sorting and transporting recyclable items. The bags don't rip when they get wet and can be used several times.

You can also use them for storing items, because mice usually can't chew through

them. To keep them closed, you can sew the tops together, or fold them over and use clips to hold them in place.

*Diana Katona
Hornbrook, California*

DIY Motor Oil Funnel

Reuse empty 2-liter plastic soda bottles by cutting off the top third of the bottle and keeping it in your trunk to use as a funnel when adding oil to your car's engine.

Use a sharp knife to cut a slit into the plastic about a third of the way down from the bottle opening, where the shape of the bottle becomes vertical instead of slanted. Then, insert scissors into the slit and cut around the bottle. Invert the top of the bottle, and you'll now have an oil funnel that fits perfectly into most cars. These homemade funnels will also work well in your kitchen.

*Barbara Coleman
Henderson, Nebraska*



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Circle #3; see card pg 81

Fresh-Smelling Drawers

When I have soap I'm not ready to use, I store it in my clothing drawers to add some scent to my clothes. I do the same with ends from candles I really enjoyed the scent of, but am not quite ready to part with. They work really well!

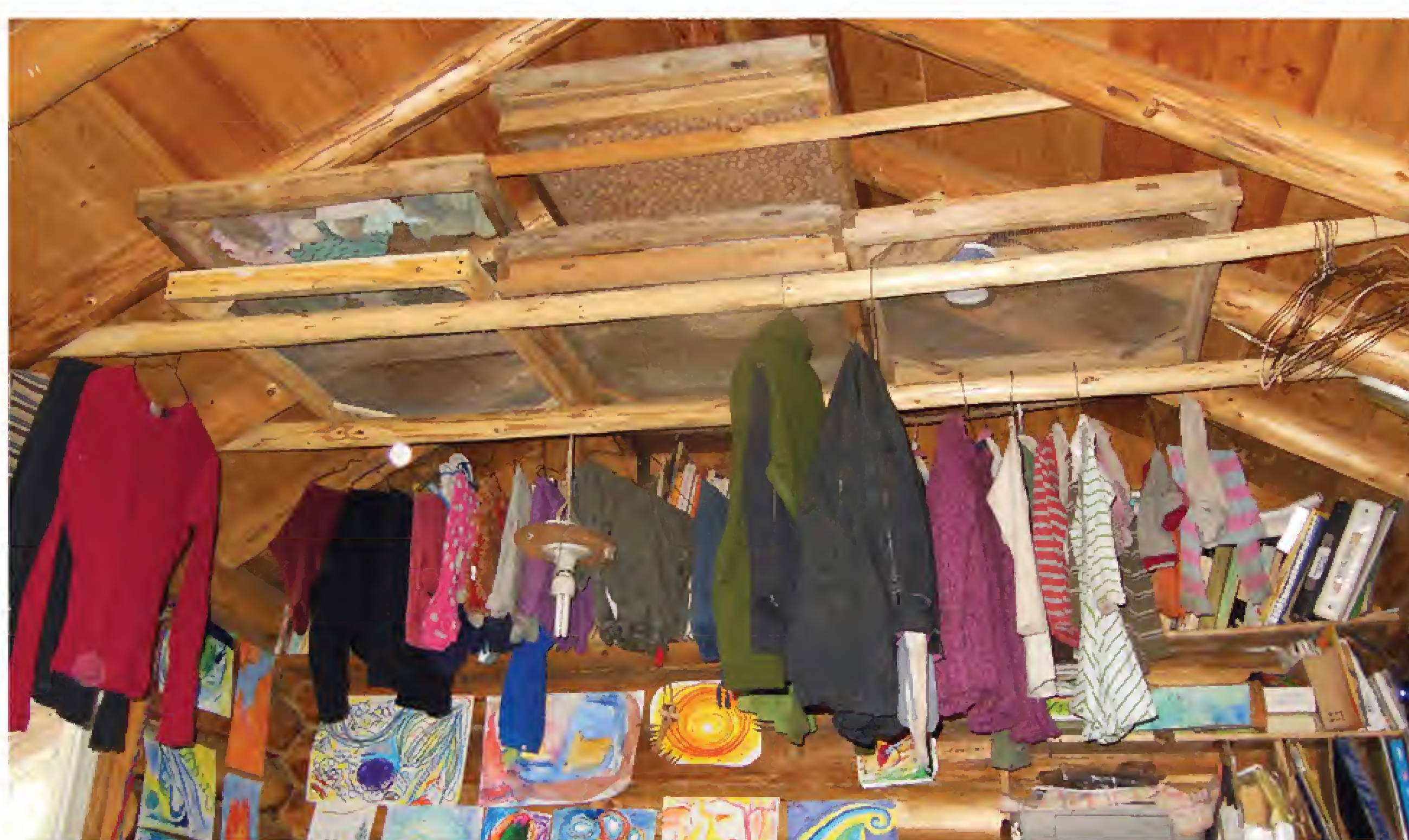
*Diana Laurenitis
Sunderland, Massachusetts*

'Steel' This Idea: Recycling Scrap Metal

As a longtime recycler, I'm accustomed to saving food cans, bottles, paper and other

materials. I also make sure to save large pieces of metal for the "scrappers" to pick up, or to take to the scrap yard myself. It's the little spare items, however, that used to bother me—nuts and bolts, ball bearings, bent nails, and other odds and ends that I hated to put in the trash, but that I knew would fall through the holes in the bottom of my scrap box.

A few years ago, I took a couple of empty metal paint cans and placed one on my shop bench and one in my garage, both labeled "Small Scrap Metal." These are convenient locations for me to drop stripped or rusted



Heads-Up! Use Overhead Space for Drying Laundry and Dehydrating Food

When living in a tiny home, using space efficiently is critical. In our 350-square-foot home, hanging laundry for four during the long winter months would be impossible, save for my husband's "laundry bar" idea. Instead of putting up a traditional laundry line and attaching clothes with clothespins, we ran 3-inch-diameter poles from one side of the cabin to the other. Instead of clothespins, we use regular clothes hangers. Several loads of laundry will now fit onto just a few poles, the clothes are high enough to be out of our way, they dry in a day thanks to our home's wood heat, and they add some much-needed moisture to the interior atmosphere in winter.

Small laundry items, such as socks, underwear, washcloths and handkerchiefs, can take a lot of time to hang individually. We deal with these items quickly and easily by spreading them out on a rack, and then sliding the rack onto the poles we hang our other clothes on. The racks slide on top of the poles and are supported on either end by them. We use this rack system for drying everything from sweaters and socks to apple slices and acorns.

We made the racks 2-by-2-feet with 1/4-inch hardware cloth stretched between the frames and held in place by nailed strips of wood. One could simply use storm window screens instead. When using the racks for drying edibles, we put food-grade mesh over the hardware cloth.

*Ashirah Knapp
Temple, Maine*

fasteners, small broken parts from bicycles or mowers, large staples from shipping cartons, and more. I also toss in small springs, parts of ballpoint pens, and metal filings and chips brushed from my drill press. I even add used steel wool! Any metal part too small to stand on its own can go into these metal scrap buckets.

It takes me about a year to fill one of these cans, but things add up! When full, I tap the metal cover back in place and seal it with a strip of duct tape to ensure that it doesn't accidentally get dumped. I then recycle the labeled cans with other metals and start a new scrap metal bucket.

In addition to feeling good about my environmental impact, these convenient cans help keep wayward nails, screws and filings from getting embedded in shoes, tires or the paws of pets.

*Philip Jacobs
St. Paul, Minnesota*

Porch Light for Poultry

A large soup can has made a great water-resistant, no-glare porch light for our chickens. To make your own, cut a hole in the side

of a can to fit it snugly on a porch light's base, and then use construction adhesive to hold the can in place. Our lamps are about 17 years old now and have rusted to a nice patina. We even punched a chicken picture into the side with a small hammer and finishing nail!

*Tom Preble
Peyton, Colorado*

Bouncing Around Ideas for Homemade Dryer Sheets

My husband loves Bounce brand scented dryer sheets. For the longest time, I tolerated using the sheets in our laundry because of him, but they're full of toxic chemicals I don't want on our skin or in our laundry. Last year I decided on a more natural approach, and my husband never even noticed the change. I keep scrap fabric by the dryer with a selection of essential oils. When I put a wet load into the dryer, I put a few drops of essential oil onto a piece of fabric and then throw it in. These homemade dryer sheets work wonderfully.

A classic essential oil to use is lavender, but a mix of ylang-ylang with vanilla or sweet



Using Scrap Wood in the Garden

While clearing land for additional garden space, we stockpiled a tremendous amount of branches and pine logs. We wanted more than a vegetable plot with straight lines, so we used short pine logs to outline our permanent garden beds. In addition to being funky, functional and free, the scrap wood offers habitat for insects, frogs and other beneficial creatures. With the abundance of branches, we created support tips for climbing crops, such as peas.

*Bob Fairbanks
Kennebunkport, Maine*

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Agave Lime Marinade

Ingredients

3 cloves garlic	1/4 cup soy sauce
5 small chives	1/3 cup Domino®
4 to 5 mint leaves	or C&H® Organic
2 to 3 tbsp fresh	Blue Agave
lime juice	Nectar Syrup

Instructions

Chop garlic, chives and mint leaves. Place all ingredients in bowl and mix with whisk. Allow marinade to sit 1/2 hour before using. Use with any white meat. Makes about 3/4 cup.

Discard any marinade that comes in contact with any raw meat.

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*Andrea Wilson
Peterborough, Ontario*

Free Wood Mulch! Some for Me, Some for You

I've found a way to obtain piles of free mulch for my gardens, and to still have plenty left to share with friends and neighbors as well. Some tree-trimming companies will dump a truckload of their mulched trimmings in a person's driveway for no charge. The company who is contracted by our local power utility to trim the trees near power lines is happy to dump mulch for any resident who calls and asks. I tip the guys who drop it off, save hundreds of dollars in mulch costs, and avoid the packaging waste of buying mulch in bags. Plus, I enjoy the opportunity to share with my neighbors. It's a win for everyone!

Two added bonuses are that my son has a great time playing on the pile before it disappears, and my neighbors use less her-

bicide now that the extra mulch keeps their weeds at bay.

*Melissa Bees
Bellevue, Nebraska*

Budget-Savvy Shampoo

Here's a great way to extend a bottle of shampoo and get softer hair in the process: Mix 2 teaspoons of baking soda and 2 tablespoons of shampoo in 2 cups of warm water. Pour the solution into a spray bottle. You'll only need a generous squirt to clean your hair. This amount usually lasts about three weeks. I have fine, dry hair, but after using this mixture my hair is healthier and softer.

*Mary Derrig
Anthem, Arizona*

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Utilitarian Ring Toss

For years, my husband and I kept the rings for our canning jar lids in a box in our pantry. I always found this method untidy, however, and I could never find the type of ring I needed. I figured there had to be a more efficient means of storing them. I wanted to have quick and easy access to the jar rings—both for when they're needed in the kitchen and for putting them away when not in use. I also wanted to take advantage of underused vertical storage space, if possible.

I mulled it over, and as it turns out, all we needed for our storage solution was a few small wooden dowels and a drill. We already had both in the garage.

My husband drilled holes the same diameter as the dowels into one of the beams in our pantry wall. We inserted the dowels into the holes and—presto!—we had instant pegs for storing canning jar rings.

*Bethany Schatzke
Billings, Montana*



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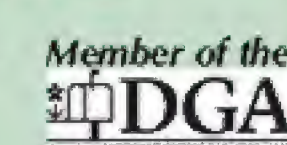
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Circle #11; see card pg 81




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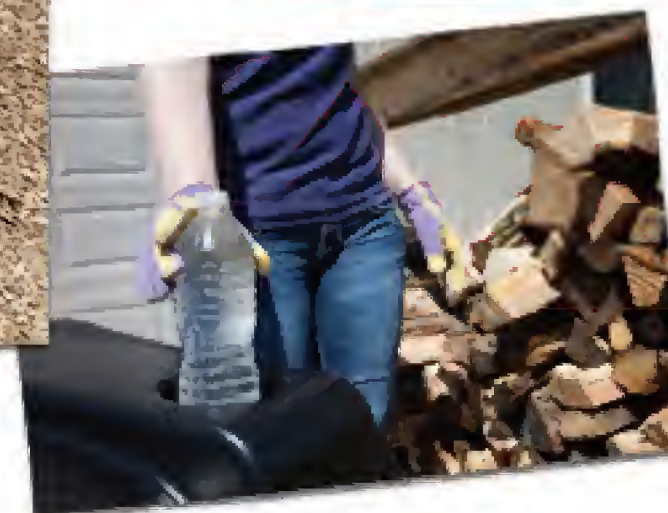


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Which Homemade Garden Sprays Work Best?

I'd like to start making my own simple insecticides. Which types of homemade garden sprays are actually effective?

Before taking the time to make an insecticide, step back and ask yourself the following questions.

Have you correctly identified the problem?

Gardeners can easily mistake injury caused by disease or extreme weather for pest damage. The choice of insecticide, if one is needed, depends on confirming the damage was indeed caused by a pest, and then identifying the pestilent perpetrator.

Are you sure the problem is getting worse? Existing damage won't disappear, but if new leaves are unafflicted, you likely don't need to spray. Similarly, if the plant is still growing and producing despite cosmetic blemishes, then taking steps to boost plant growth is a better option than attacking pests.

Do you know which beneficial insects to expect and how to identify them? These advantageous insects

are usually present but difficult to see; eggs and larvae are tiny and don't look anything like adult insects. You want to ensure that, if you do spray, you won't harm beneficials' populations. Also, the beneficials may handle the pests for you if given the opportunity and time.

Will other pest control methods work? It depends on the pest, but barriers, traps and other non-pesticidal methods can often perform better than sprays.

If your crops do indeed require an insecticide, the two homemade sprays I recommend are plain water and diluted soap. Strong sprays of water will control aphids, pear and rose sawflies, spider mites, and thrips. For aphids, spray at least twice, waiting two to three days between each spraying. Learn how to create a custom watering wand for this method of organic pest control at <http://goo.gl/QhReHG>.

Soap sprays are effective on leaf-eating insects, sucking insects and mites, but only if the spray comes in direct contact with the pests. Use



No need to craft a complex concoction to banish pests; soap and water can do the trick.

only pure soap, such as Dr. Bronner's castile soap, and not laundry or dish "soaps," which are actually detergents that contain perfumes and other ingredients that can damage plants. Soap solutions can burn or even kill plants if they aren't sufficiently diluted. Include a maximum of 3 tablespoons of soap per gallon of water. You can also purchase a product that's specifically formulated to kill bugs without burning plants, such as Safer's Insecticidal Soap concentrate.

Homemade garden sprays that contain hot peppers or aromatic herbs are gratifying to concoct, but they'll most likely have little effect on insects—it's the soap typically added to these mixtures that actually works.

No matter which spray you make or choose, bear in mind that if it's effective on pests, it will also kill beneficial insects and other non-target organisms.

—Linda Gilkeson

Tomato Plants: To Prune or Not to Prune?

What are the different methods and impacts of pruning tomato plants?

Side shoots, or "suckers," are additional fruiting stems that emerge on tomato plants at the junctions of the main stems and leaf stems (see photo, Page 74). Some folks recommend removing all suckers; I disagree. Contrary to what many think, suckers don't sap energy from the main tomato plant, and allowing

them to develop will not delay fruiting or ripening of any tomatoes from the main stem. Judicious removal of some suckers, however, will lead to more controlled growth and make supporting the plant easier, especially with an indeterminate variety.

Essentially, suckers are the tomato plant's way of passing on its genetic heritage by producing as many seeds as possible: More branching leads to more flowers, which lead to more tomatoes, which lead to more seeds, which, to a plant, mean survival.

Removal of suckers could have implications for overall yields. Each sucker allowed to grow will provide additional flower clusters, and hence create additional chances for fruit set. Sometimes during the season, the majority of the flower clusters on a tomato plant's main stem will open when the temperature or humidity isn't suitable for pollination, which can result in blossom drop. If you've snipped off all the suckers, then the plant will bear only a handful of fruit, with no method available for the plant to produce additional

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Suckers (above) won't sap life from tomato plants, but you can put the shoots to good use by rooting them (right) to grow new plants.



flowers after the hot weather has passed. If suckers would've been maintained, the number of flower clusters would've increased, and flowers on those additional growing shoots likely would've opened later under more suitable conditions, thus increasing the yield of the plant.

Suckers that are allowed to grow will also furnish additional foliage cover. In climates

where searing sun regularly beats down on exposed, developing tomatoes, sunscald poses a definite concern. Because direct sun isn't needed to promote ripening, the shade cover provided by the suckers' foliage is beneficial.

Ideal management of suckers is somewhat dependent on the type of tomato. Determinate tomato varieties grow to a genetically predetermined height and width, and then produce

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How to Change Chicken Ordinances

Does your city have a ban on keeping backyard chickens? We asked our Facebook community for tips on how to approach a city council to revise such ordinances. Here's how some of them took their towns to task.

We changed the chicken ordinance in my city by starting a petition and getting thousands of signatures, and then presenting the petition along with our request to our city council at a regular meeting. We then met with each council member individually and worked with the city to develop the ordinances for keeping hens and bees. —*Jennifer Alley Gron*

Does your municipality have an Environmental Advisory Council (EAC)? If not, consider starting one, have it propose an update to your ordinances to allow chickens, and then present your proposal to the city council. I'm on my city's EAC, and we recently completed that process. Our council voted on our proposal and it passed unanimously, so we're now able to keep backyard chickens. —*Jim Keller*

Our county seat just went through this. Several interested families put together a petition and took it to events—such as the county fair and poultry shows—to begin drumming up support. The group then approached one of the city council members—one who they thought would be helpful in the matter—and got guidance. Eventually, the topic was included on the agenda for a city council meeting, and the group presented the petition and other information on the benefits of keeping backyard chickens. Unfortunately, the city council voted against the revision, but the amount of support the petition received shows that at least some community members are interested in change. Do any other communities in your area allow chickens? See whether you can glean any information from them. Good luck! —*Ann Marie Fantz*

Circle #56; see card pg 81

flowers at the ends of their branches. In a sense, they are “self-pruning,” and any removal of suckers would reduce the potential yield of the plant. An indeterminate tomato plant, however, extends its main growing stem indefinitely and will generate suckers at each point of a leaf stem attachment. Indeterminate tomato plants can quickly grow out of control because the suckers themselves go on to produce suckers, so a plant can become dense and complex by midseason.

Skillful “topping” of fruiting tomato branches and stems at particular heights is a way of controlling growth. Because more flowers form than will pollinate and ripen before the end of the season, topping will also ensure that a plant doesn’t put energy into developing tomatoes that will never get a chance to ripen properly. Removing the top of the plant is also an excellent way to prevent plants from becoming so top-heavy that they topple in storms or develop kinks in their branches.

An easy way for gardeners with long seasons to extend the harvest even further and put removed suckers to good use is to cut and root some of the suckers. Suckers root easily and can be planted in early summer. They will

yield tomatoes that are clones of those of the plants they were taken from.

To do this, cut a 6-inch-long sucker from one of your healthy plants and put it in a glass of water. After it has a nice set of new roots, pot it up in fresh potting mix and allow it to adjust in a shaded location for a few weeks before setting it into its final digs. Some gardeners have found that suckers will root directly in the garden if placed in a shaded area. Keeping the rooting suckers out of direct sun is important. Typically, a tomato sucker will root and begin to show renewed growth in a few weeks at most. Often, a sucker planted in damp soil will wilt just a bit until new roots begin to grow.

—Craig LeHoullier

Adapted from Epic Tomatoes, Storey Publishing, 2014 (see Page 64 to order).

Stumped about something in your home or on your homestead? Email your questions to AskOurExperts@MotherEarthNews.com, or write to Ask Our Experts; MOTHER EARTH NEWS; 1503 SW 42nd St.; Topeka, KS 66609.

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Circle #42; see card pg 81

The best thing to do when working with any city board on any subject is to come forward with as much information as possible. The less work they have to do to follow up when writing the revised ordinance, the more likely they will be to move forward with it. —Shana Donner

It's easier to ask for forgiveness than it is to ask for permission. As long as your neighbors don't complain, live your life! —Redbeard Welder



Forbidden flocks? If local laws deny your right to keep backyard chickens, work to change them!

We strongly believe that cities should permit residents to keep a few hens within city limits, and we understand that many of you are working to change local laws so you can keep chickens legally. We've developed a statement in support of changing chicken ordinances, which you can find on our website at <http://goo.gl/nZqsKr>. Feel free to use or adapt this statement if you're working to get an ordinance passed to allow chickens in your city. Please keep us posted on how your efforts turn out. You can find our contact information in the box above. May the flock be with you! —MOTHER



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Circle #41; see card pg 81

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(CONTINUED FROM PAGE 8)

Recycling Worth It?" I read every word of it, and I even clapped at the end. Then I got to wondering about products that are made from all of those things we toss into our recycling bins. In other words, what becomes of our recycled materials after they leave recycling centers?

Most of us know that some wonderful paper products get made from recycled paper, such as toilet paper, napkins and paper towels. Purchasing these options could save hundreds of hardwood trees in our forests. But what about what happens to all the other products we recycle?

As consumers, we need to know what to look for. If we all committed to buying items made from recycled materials, think of the potential impact. My hope is that someone who knows a great deal about these kinds of products will write that article. I, for one, would read every word, and I'd then look for those products in stores.

*Ruth Peebles
Pleasant Hill, Tennessee*

Ruth, you may want to check out the website www.GoodGuide.com, where you can search thousands of products and filter by "recycled" and other variables. GoodGuide also offers a smartphone app that lets you scan a product's bar code to get information on its health, environmental and social impacts. —MOTHER

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Circle #38; see card pg 81

Be Mindful of Grain Mites

The tip from reader John M. Williams of Aurora, Wis., about starting seeds where he broods his chicks is a great idea (Country Lore, February/March 2015). Beware, though: I had virtually the same setup last spring, and disaster struck.

Please advise your readers never to store their chicks' starter grain indoors. I suddenly noticed that my hundreds of seedlings were failing and I didn't know why. They had been so vigorous just three days earlier. Upon closer inspection, I thought to myself, "Wow, this room sure got dusty. Wait—is that dust ... moving?" Well, after much research, I found out that I had grain mites. They eat anything organic, and a whole colony of them had arrived in the bag of starter grain. The population exploded in less than a week, and I had to toss the grain as well as the seedlings.

I also had to "bug bomb" my house to finally get rid of them—they're so small that they just kept surviving in any crevice. I'm not joking when I say they were up to my ceiling.

Anne Babb
Beaufort, Missouri

Serving Up Cooking Skills

I'd like to respond to the recent reader letter titled "A Hunger for Home Ec" from Sally Smith (Dear MOTHER, February/March 2015). The Food Backpacks 4 Kids program in the Key Peninsula area of Washington state has a slow cooker initiative in place in which families who ask will receive a brand new

MOTHER's Wish List

Food preservation bloggers. If you've become skilled in a realm of home food preservation—canning, freezing, drying, fermenting, brewing, curing, smoking, root cellaring or cheesemaking—we invite you to join the MOTHER EARTH NEWS Blog Squad to contribute to a special project that's in the works on our website. Send us an email with the subject line "Food preservation blogger" at Letters@MotherEarthNews.com to learn more about this opportunity.

Seed-starting options. What's worked best for you? We'd love to see photos or plans of your home seed-starting setup. Find our contact info on Page 84.



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Circle #47; see card pg 81

slow cooker, a child-friendly recipe book of healthful recipes, and bulk food items, such as beans, rice and even oatmeal.

Families qualify through the local school district's free and reduced lunch program, and, since we started the initiative in summer 2014, we've given away between 50 and 75 slow cookers.

We've taught some families how to make their own chicken stock, and we're working with many local families to teach them how to grow their own food and live more sustainably. *Viva la slow cooker*, indeed!

*Diba Wickline
Gig Harbor, Washington*

*Learn more about Food Backpacks 4 Kids at
www.PeninsulaCommunityFoundation.com.
They're really cooking!—MOTHER*

Learning How to Cook

I want to support what reader Sally Smith stated in her letter in the February/March 2015 issue (Dear MOTHER), in which she advocated for educating young people about basic cooking skills so they have an alternative to purchasing processed foods.

I can attest that the younger generations will cook at home (and even from scratch), regardless of time and effort, so long as they know how. I've been doing just that since I graduated from college, when I pledged to eat more locally and seasonally.

For those who don't have the skills or knowledge and aren't sure where to look for it, I highly recommend reading Kathleen Flinn's book *The Kitchen Counter Cooking School*.

*Sarah Owens
Hood River, Oregon*

Pesticide Info: Demand It

I've become increasingly concerned about possible pesticide contamination of seeds and plants I've purchased. Do I need to be worried about unknowingly planting such contaminated items in organic soil? Can I take the supplier's word for it if they say they don't use persistent, systemic pesticides?

After reading your articles about neonicotinoid pesticides, I contacted some of the nurseries I frequently order from. The most striking thing about these conversations was that the plant specialists at the various companies seemed surprised to hear the question. One person said that no one had



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ever asked him that before; another reported that their horticulturist didn't know whether neonicotinoids were used.

Systemic pesticides will likely continue to be applied, at least in the near future, but perhaps one way for gardeners to facilitate change is to keep on asking these questions.

*Josephine D'Alessandro
Dingmans Ferry, Pennsylvania*

We agree, Josephine. The more people who ask, the more pressure companies will face to forgo systemic pesticides. And if a salesperson doesn't know the answer, ask to have the manager notified that you will no longer buy the business's products if they can't tell you what is in or on them. —MOTHER

I'm Lovin' That Oven!

Thank you to fellow reader Pat Hill for her letter and photo of the all-in-one outdoor cooking unit she built (Dear MOTHER, April/May 2015). My dream has been to build this oven for our family.

A few days before the April/May issue arrived, I'd begun searching through past issues of MOTHER EARTH NEWS for your article about constructing the oven, but I hadn't found it yet. Then I opened the new issue, and there it was! What are the chances of that?

*Amy Strazza
Waco, Texas*

Solar Power's Carbon Footprint

In response to "Wind and Solar Costs Can Compete" (Green Gazette, April/May 2015): What is the *actual* carbon footprint and the *actual* rate of return on a solar power system? Take into consideration the mining of materials, chemicals used, energy needed for manufacturing, installation and waste, energy produced over the panel's actual lifetime, and maintenance and repair costs.

I love the idea of solar, but my personal experience and my admittedly crude and unresolved calculations leave me doubting. Is there a definitive, unbiased study out there?

*Tim Coleman
Flatgap, Kentucky*

Good question, Tim. A recent article in National Geographic (<http://goo.gl/sGbL93>) outlined the progress that's being made to answer this complex question. Of course, we also should have been asking these same



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questions about the sustainability of our fossil fuel system a long time ago. —MOTHER

Beat Tomato Blight

I read through my February/March 2015 issue of MOTHER EARTH NEWS with great interest, particularly the article “ID and Prevent 6 Common Tomato Diseases.” I have a recipe to prevent early blight that I got from an old farmer in North Clarendon, Vt., and it has been working well for me for years.

Before transplanting, mix:

3 cups compost
1/2 cup powdered, nonfat milk
1/2 cup Epsom salts
1 tbsp baking soda

Sprinkle a handful of the mixture into each tomato’s planting hole. Then, after planting, sprinkle a little more powdered milk on top of the soil around the plant, repeating once a

More Food-Frugal Tips

We just read the article “25 Fresh Ways to Put Extra Food to Good Use” in the April/May 2015 edition, and we have some ideas of our own to share.

- **Salad into stir-fry into soup.** Our fresh summer veggies go first into a salad. Leftover salad becomes a stir-fry at the next meal. Any leftover stir-fry goes into the freezer for winter soups. To make soup from a stir-fry, simply add water and heat. Guaranteed deliciousness.
- **Parsley, preserved.** We pick our extra parsley at the height of the growing season. We wash and bundle it with a rubber band. After shaking off the excess water, we put the bundle in a freezer bag that lies flat in the freezer until winter. When needed, we pull out the flattened bundle, place it on a cutting board, and cut off the length we need for a particular meal. The remainder goes back into the bag and back into the freezer for later use. This method also works with other tender herbs, such as basil and chives.
- **Pesto packs.** We make extra pesto when the basil in our garden is at its peak. For a simple pesto, we put a couple of fresh garlic cloves in the blender with

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month throughout the growing season. This will also help prevent late blight and certain other tomato diseases.

Steve Pratt
North Bennington, Vermont

Using large amounts of Epsom salts (magnesium sulfate) can be helpful or harmful, depending on your soil's mineral levels and pH. It's a good idea to have your soil tested before applying any soluble minerals (such as Epsom salts) in your garden. —MOTHER

A Realtor's Worth

The article "65 Self-Reliance Tips That Will Save You Money" (February/March 2014) mentions that a way to cut costs when shopping for land is to avoid the real estate agent's fee. A good real estate agent, however, can provide knowledge on planning and zoning, and, of course, on the value of property. An agent's input on a transaction often saves



Prep a profusion of pesto during peak basil season, then freeze it to savor later as a superb pasta sauce.

a small handful of raw sunflower seeds and a big handful of washed basil. Then we add just enough water or olive oil to blend everything into a juicy paste. We pour this paste into disc shapes on waxed paper on a tray. The tray goes into the freezer, and after the discs are frozen, we put them into a plastic bag for use all winter. We like to sprinkle fresh Parmesan cheese on top of the discs just before heating and adding to pasta, or melt the discs into winter soups and stews.

Susan and Bill English-Alkire
Wooster, Ohio

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the buyer thousands of dollars. Open-space knowledge, financing options and seller negotiations are just a few of the many details an agent can address in a land purchase.

*Dick Loomis
Putnam, Connecticut*

A Beacon of Sustainability

I just read your December 2014/January 2015 article "Another High Cost of Factory-Farmed Meat: The Death of Small Towns," along with Joel Salatin's column about "new-fashioned farms" (The Pitchfork Pulpit). Outstanding work! Your publication has always been a beacon to those seeking sustainability and independence from our society's destructive norm.

While we access your magazine at public libraries, we intend to give subscriptions as gifts to family and friends. Thank you for the sanity you offer.

*Jeff Marlow
via Facebook*

Feedback from a Fan

I was introduced to MOTHER EARTH NEWS when I was working as a national park ranger in Death Valley National Park way back in 1977. Your February/March 2015 issue had many articles that an old environmentalist like me could relate to, such as the Green Gazette pieces on food waste, solutions to our water crisis, dropping costs of solar panels, and autism's link to pesticides, as well as your in-depth articles on community-scale renewable energy ("Power from the People") and recycling ("Is Recycling Worth It?").

That's what I enjoy about your magazine—your love and concern for our environment and the diversity of articles you print. Keep up the good work!

*Richard Thorum
Midvale, Utah*

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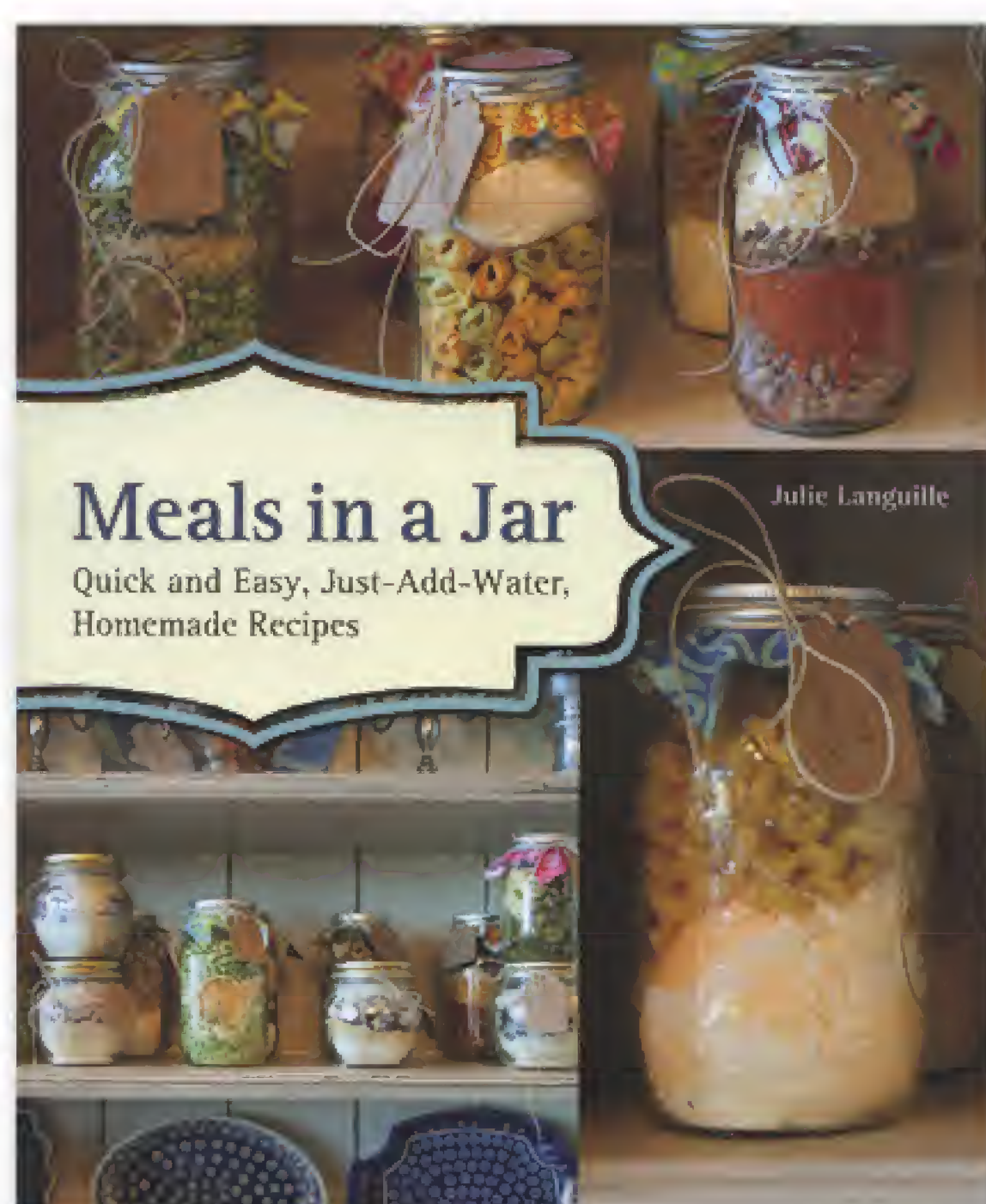


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Julie Languille

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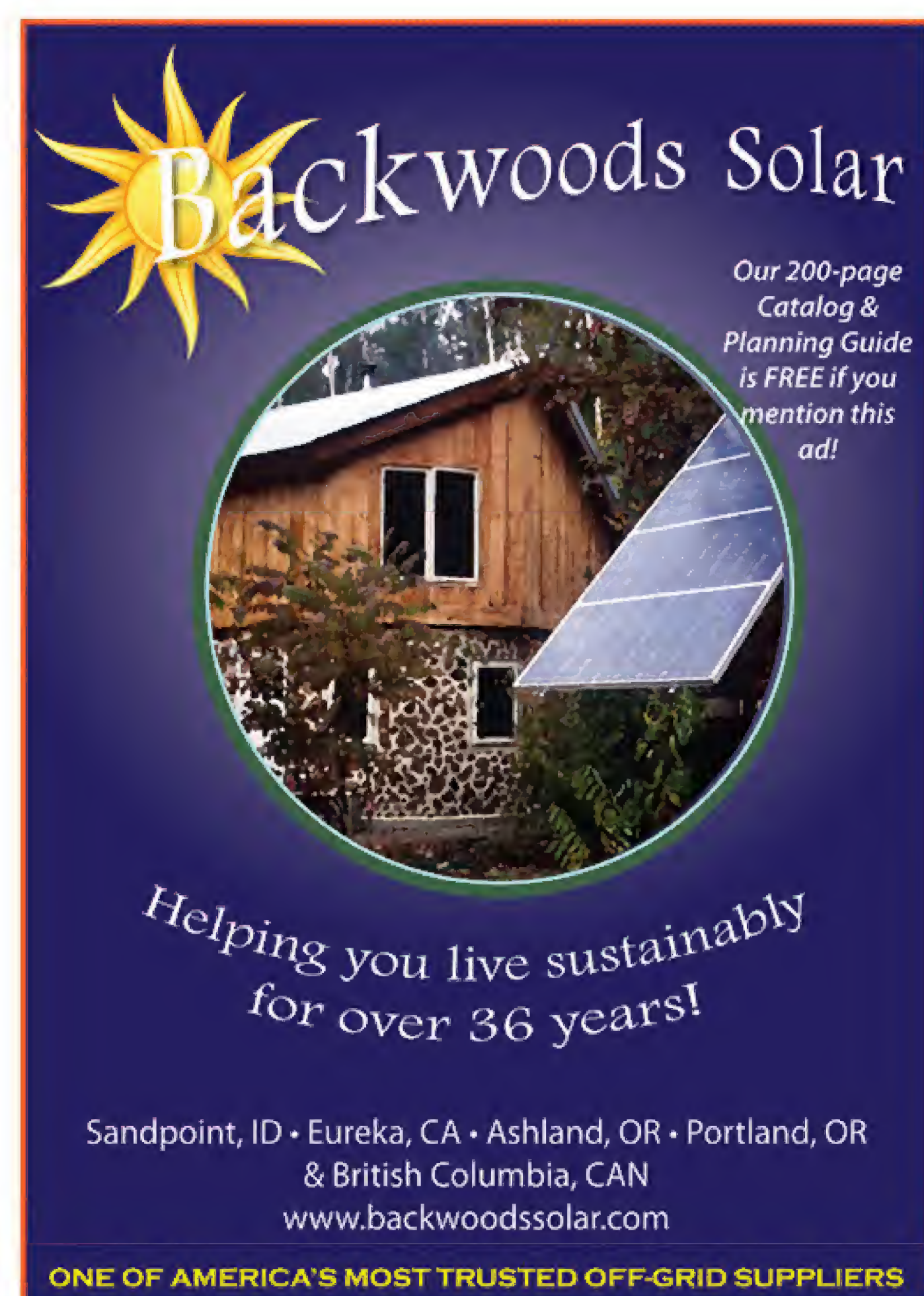
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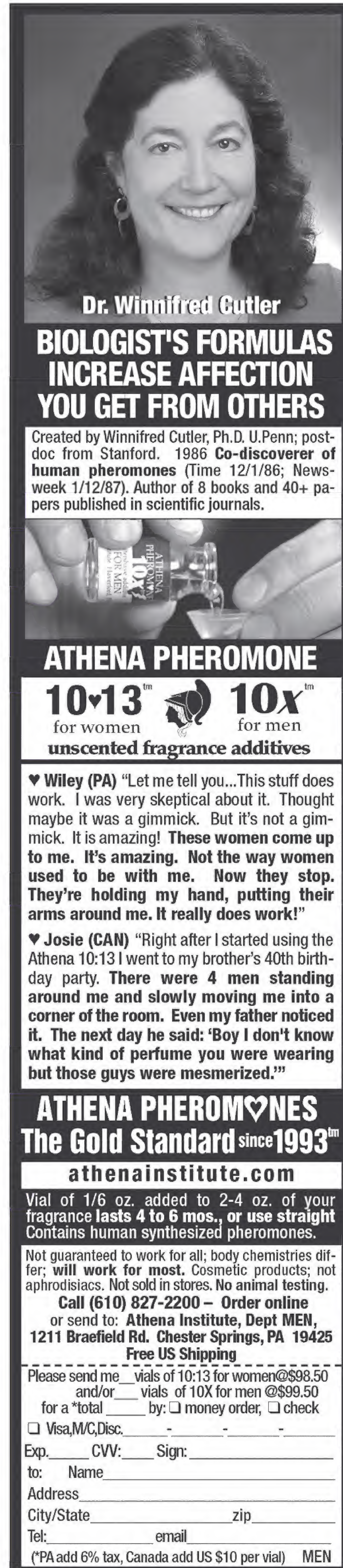


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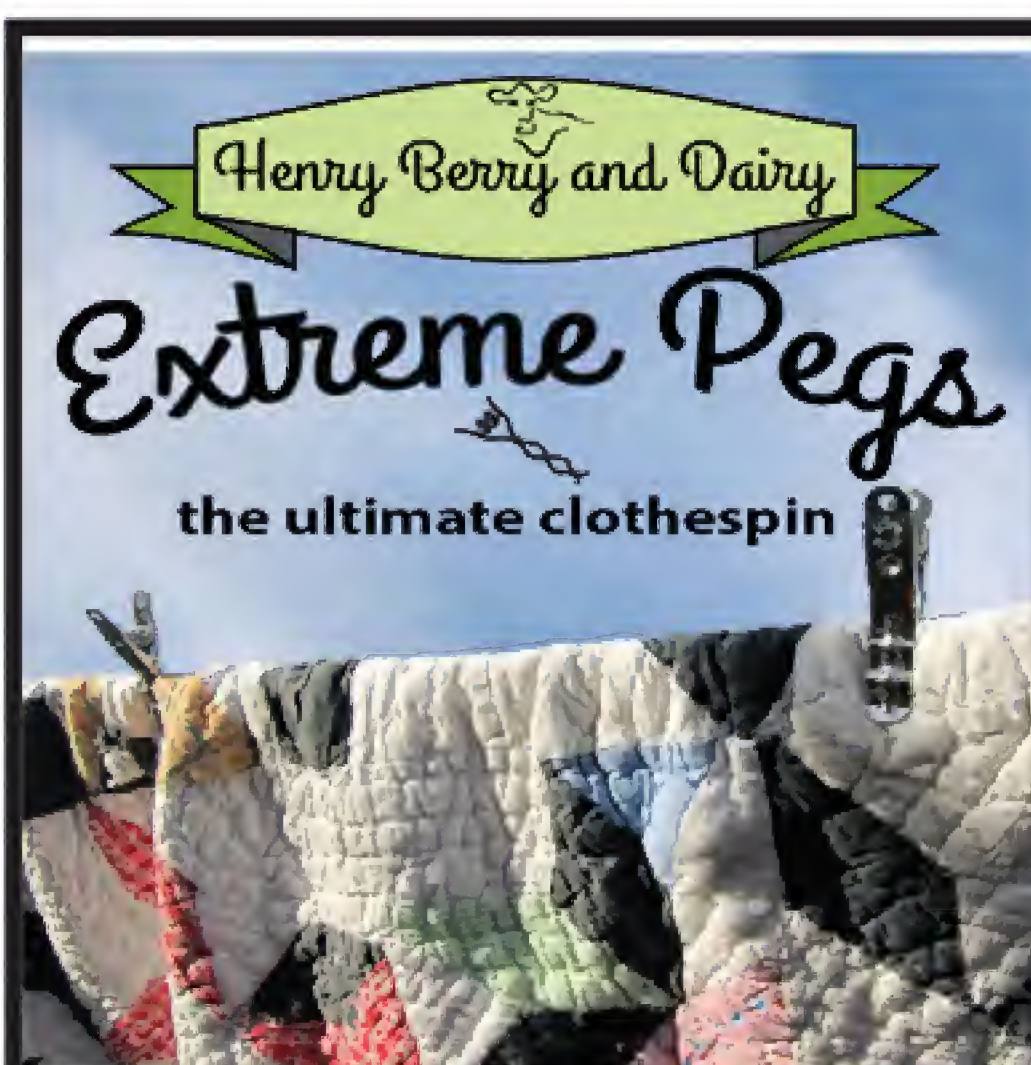
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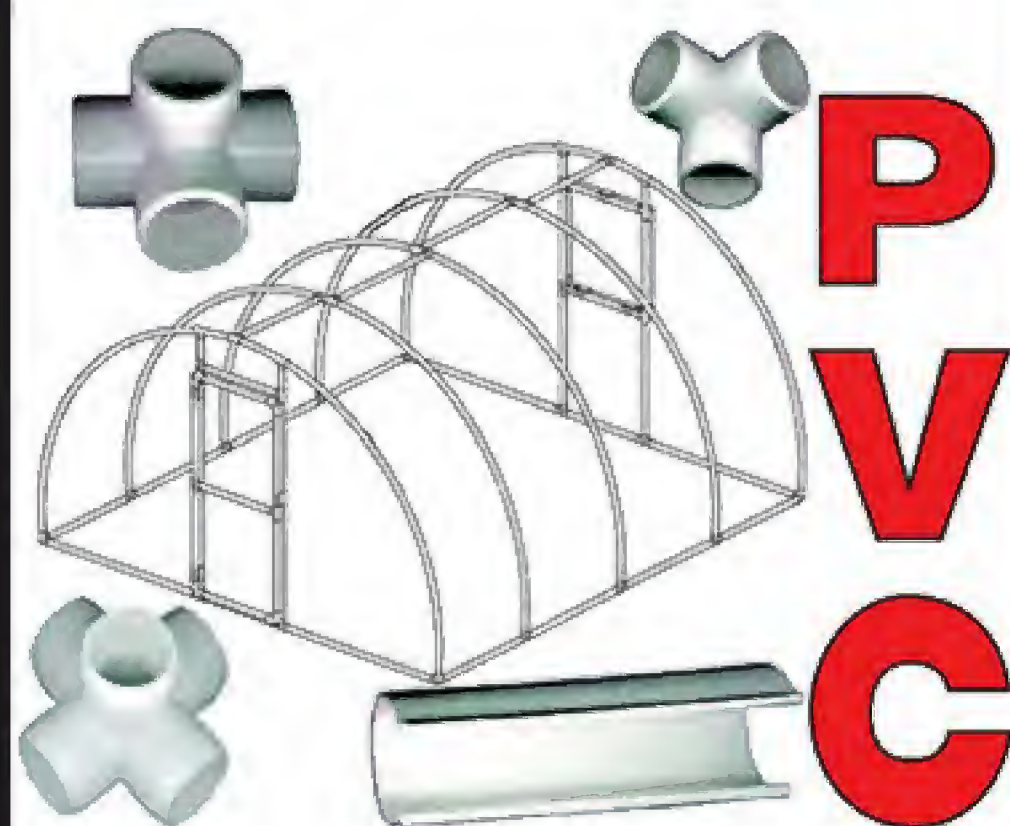
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